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THE AUTOMOBILE AND MOTOR REVIEW

WEEKLY

NEW YORK—SATURDAY, DECEMBER 20, 1902—CHICAGO

10 CENTS

SPECIAL styles in wearing apparel for use by motorists, and in connection with automobile sport, made their first appearance when the speed of motor

Women's Furs for Winter Driving.

to protect the ordinary clothing of the automobilist from the mud spattered from

growth of the necessities of the new sport, fads and fashions in automobile clothing

dered them superfluous. From this spontaneous beginning which was an out-



TOQUE, WRAPS AND VISOR FOR MILD WEATHER.

With view of fur cap or turban for clear frosty days. The visor is of mica and is worn only for fast driving in the open country.

cars rose above twenty miles per hour. They were all designed to afford the necessary protection against the air, rendered sharp by the rapid motion. Goggles and gauntlets were the principal requisites. Men only were considered. Then followed some ungainly costumes meant

the wheels and permit him to lie on his back under his refractory vehicle attending to needed repairs and adjustments. They belonged to the experimental period of automobilism and have practically disappeared with the improvement of automobile design and mechanism which ren-

soon took more fanciful flights, when men's and women's tailors discovered that here was a profitable field. Certain designers of fashions in Paris and London took it upon themselves to imagine what automobilists might want, and when women began to take kindly to automobiling,

fancy was given free rein. But it was nearly always a tailor's fancy. It smacked of the shop and of the desire for profits, more than of intelligent understanding of the needs of automobilists. To this day the fashions express only the single thought which first found lodgment in the tailor's mind, namely, that automobiling means exceedingly rapid locomotion in open cars, and that its devotees desire to signify by their clothes that they are thoroughly equipped to brave the elements for the sake of the sport.

Meanwhile, the automobile public themselves stand aside and watch what the creators of clothes will offer them next, and dress as they please. From the large choice offered them of garments labelled with the word "automobile," they select one here and there and stamp it with approval. The rest goes back to the fur-

speed he desires, in what kind of weather he wants to drive and to what extent he must keep his feet and body unencumbered and ready for action.

The woman, however, can afford to be careful of her appearance and selects the sightliest garments her purse can afford.

The furs offered women automobilists cover a greater variety than ever before, not only in regard to the pelts employed, but also the cut of the garment.

THE FASHIONS NOW OFFERED.

The three-quarter length coat is, possibly, the most striking favorite, but aside from this the short jacket is very much worn. In selecting a coat for automobile wear, it is best to get one that is rather loose, so that a sweater can be worn underneath it.

The furs employed for these automobile coats are naturally of a rather rough de-

lynx is a particular favorite in this style.

A very extreme mode of costuming for automobile wear that is intended solely for the heaviest weather is a regular Eskimo outfit of reindeer. This consists in a great shaggy coat that goes over the head and has a hood attached. Leggings of the same fur come up to the knees, and as the body is protected down to that point by the coat, the whole figure is entirely covered. The feet are encased in moccasins of reindeer which, of course, are absolutely warm. In wearing such a suit skirts have to be discarded. The set is only meant for the severest kind of weather or for touring. It is, however, a novelty and quite a few fashionable women have invested in one of these reindeer suits.

For shopping and for other occasions when milady will be in and out of the automobile and does not desire to attract too much attention, automobile fashions are naturally dropped in favor of the general fashions of the day, which shall not be here described.

A particularly graceful and striking coat is of ermine unadorned. With this is worn a little toque of the same fur, which is also without trimming. The dead whiteness of the whole is striking, but artistic and pleasing. This coat is mostly shown in a box effect of about medium length. It fastens in front with a double row of fancy metal buttons, and at the neck is a white silk cord and tassel to relieve the monotony.

The short baby lamb coat unadorned is another fashionable mode, and this is usually with broad collar and wide cuffs.

Many of the coats are made with regulation auto caps to match. These caps, however, are not becoming, and except for touring purposes, a more dainty style of head gear is to be preferred. Even the round seal cap is better than the automobile style. It is much more effective and jaunty, and aside from this it becomes most women very much better. Still more dressy is the pretty little toque of fur. This may match the coat, although it is not necessary for it to do so. Squirrel, ermine, mink and sable are the popular pelts for these affairs.

In the matter of hand coverings, some women affect the heavy fur glove with wide gauntlet. This, however, is rather cumbersome, and except for the chauffeur, is not to be recommended. The heavy knitted woolen glove is very popular and serves its purpose splendidly.

Fur shoes and footwarmers are somewhat in evidence, but these usually form part of the set and are in the furs already alluded to.

The robes run to coon, leopard, fox, bear, reindeer and lynx as the favorites.

Proposed Tax in Buffalo.

The lawmakers of Buffalo now propose to frame an ordinance requiring a special tax on all vehicles using the city streets,



COMPLETE ESKIMO OUTFIT FOR WINTER TOURING.

Pelts are reindeer and very heavy — Skirts are discarded for fur leggings — Feet are encased in moccasins.

rier's shop or to the *magasin des modes* and is sold for what it usually is: an embodiment of the tradesman's attempt to reap a profit from the fads entwined in automobiling. Cautiously he makes this attempt in the most inexpensive manner by merely affixing the hallowed name to a garment or a wrap which might be sold just as well on grounds of all-around utility in winter weather.

This being the situation the styles offered in the fashion market to-day—mostly furs since winter has put in his grim appearance—do not indicate what must be worn or what will be worn, but only what may be put on if the fancy seems fitting.

Men have practically revolted against all dictation in the matter of clothing. Each knows his machine, knows what

description in the heavier garments. Lynx is quite a favorite. One very serviceable and popular form is a three-quarter length lynx coat lined with ermine. The collar is a very heavy affair of sable, and of a high standing description. The cuffs are of this same fur. With such a coat the regular automobile cap is permissible, but except for severe weather is not to be recommended, as it is not an especially pretty form and could never be classed as beautiful.

A new idea for automobiling of this season is to show a complete set, consisting of coat, cap and gloves, and even foot warmers and rug all in the same fur. A set of this description is no more expensive than the pieces bought separately, and is considered extremely modish.

the revenue to be applied to a fund for the repair and maintenance of the pavements. A great protest has arisen from vehicle owners in general and automobile owners in particular, the latter claiming that as

its turn; and this notwithstanding that such measures have been repeatedly declared unconstitutional, since vehicles are taxed as personal property and are not legally subject to special taxation.

had fallen down in Exchange Street, the driver of a gasoline car offered his assistance to bring to its feet one of the animals that had been unable to rise if the owner would get a rope. This being pro-



FUR AUTO COAT, HAT AND MUFF.

The coat, hat and muff in this set are all made of lynx, with coat showing a sable collar. The hat is of the German military form, and the muff has that peculiar cut that stamps it as an automobile effect.



A PRODUCT OF FURRIER'S IMAGINATION.

The supposition is that the woman has stepped from her automobile to the foyer of the opera leaving her robes in the vehicle.

their vehicles are rubber tired and cause no destruction to the pavements, they should be exempt. The proposition to raise funds for street paving and maintenance by the imposition of a special tax on vehicles is an old one, which, it seems, that every city and town must consider in

Auto as a Horse Raiser.

More than once the automobile has come to the aid of the horse, but the recent bad weather, which made the streets of Buffalo as well as other cities slippery, afforded the opportunity to do so in a new way. Coming upon a team of horses that

duced, one end was tied to the rear axle of the touring car and the other end was passed around the hind quarters of the horse. A movement of the starting lever and simultaneous application of the driver's whip to the animal's back, brought the horse to a standing position so quickly

and easily that he looked around in surprise. Before the arrival of the automobile he had become almost exhausted through repeated ineffectual efforts to regain his footing.

Motor Stolen from Automobile.

The Pittsburg detective force is trying to discover who were the thieves that entered the stable of William Williamson, a local automobilist, and wrecked his machine. One night recently, after having a friend out all evening, Mr. Williamson put his machine away, and after locking the door returned to the house. In the morning he discovered that thieves had broken into the place and demolished his automobile. The design of the culprits was to obtain the 300-pound gasoline motor in the machine, and in this they were successful. But they wrecked the entire \$1,200 vehicle in accomplishing their purpose.

Motor Rural Mail Delivery.

An automobile rural mail service, just introduced in Eastern Indiana, is reported to be succeeding in spite of unfavorable weather conditions. The machines were built for this especial purpose, and are fast and strong. The trial of them has been more than satisfactory to Superintendent Rathbone, and more of the motor wagons may be put on the rural routes of the State. Their introduction cannot be general, however, on account of the bad condition of many Indiana roads, but it is believed by the head of the rural mail division that if a few machines are introduced there will be a general clamor for them on many of the routes and that this will result in better roads being built. This first motor mail service line, which is out of Richmond, will be subjected to the severest test during the winter months.

Up-to-date Sign Board.

One of the interesting advertisements now attracting attention on a billboard near the Massachusetts Automobile Club is a garish painting of a be-goggled automobilist taking his "lady friend" out for a spin. He appears to be taking a very winding road, with surprisingly sharp angles considering the speed at which he is indicated to be going. At the top is the inscription in large letters, "Only 20 Minutes by Auto!" A line beneath the picture urges everybody to visit a little roadhouse in the Riverside district of Newton. To reach the place in twenty minutes "by auto" from the Back Bay, the ordinary operator would have to make the run before dawn of a Sunday morning, when police vigilance is relaxed; but the sign is an up-to-date innovation.

Topeka, Kan., has passed an ordinance fixing 8 miles per hour as the speed limit on certain streets and 16 miles in the rest of the town.

Auto Information for the Novice—III.

Steam as a Flexible, Quiet and Familiar Power—Advantages of the Steam Vehicle and Points to Be Observed in Its Management.

BY W. P. STEPHENS.

AMERICAN STEAM CARRIAGE—PART II.

One of the great advantages of the steam engine is its "flexibility" or range of power, a point which will be better understood in comparison with the gas engine. By nearly closing the throttle valve, which is in effect merely a door across the pipe which conducts the steam from the boiler to the engine, the latter may be made to move so slowly that the wheels of the carriage barely revolve, and yet

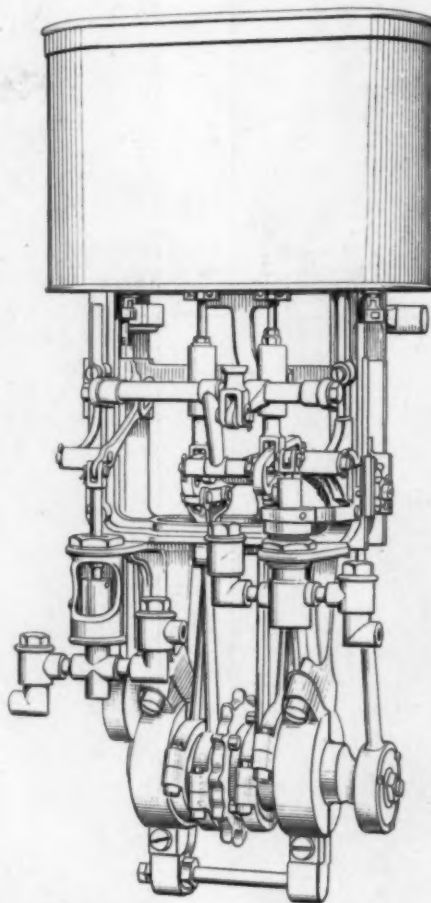
short chain. This brings the engine about under the seat, and it is desirable to place the boiler as close as possible to the engine in order to shorten up the piping and avoid loss of heat by radiation. The water tank forms an excellent jacket to retain the heat of the boiler and to protect the body of the vehicle, at the same time utilizing the waste heat in heating the feed water. All of these considerations tend to bring the machinery into one compact mass, which fits easily into the rear body and under the single seat of a runabout; there remains only the gasoline tank to be disposed of, and a cool place, at some distance from the fire, is found under the front of the body.

FORM OF VEHICLE BODY.

The ordinary box body of the old horse-drawn carriage is well fitted to enclose this arrangement of parts, and the ordinary elliptic springs are all that is necessary by way of comfortable support for the moderate weight. It is quite natural that most of the light steam cars have been worked out along these lines, and that, in spite of a short wheel-base and a rather high center of gravity, they have proved eminently satisfactory in practice. When it comes to the surreys and other larger vehicles the same general plan has merely been elaborated.

OPERATION OF STEAM CARS.

In starting out in a steam car the water and fuel tanks must first be filled, and the air tank as well, a bicycle foot pump being used for the latter. The torch or other apparatus for starting the vaporizing process is then lighted and kept going for a few minutes until vapor can be had from the gasoline pipe, when it is extinguished and the gasoline turned on. In the course of about twenty minutes from the commencement of operations the steam gauge will show a pressure of upward of 200 pounds, and the car is ready for the road. Once in his place on the seat, the operator has in front a tiller—pointing backward instead of forward, as in all yachts—or possibly a straight bar hinged to a vertical post and lying across his body within easy grasp of one hand. The other hand rests on the throttle, just outside the seat, with the reverse lever and by-pass near by. Below on the side of the carriage, with its cocks within easy reach, is the water column and the gauge glass, the latter showing at a glance the height of water in the boiler. As the posi-



TYPE OF STEAM ENGINE MUCH USED.

at the same time this slow motion may be kept up indefinitely. As the throttle is opened and more steam admitted, the speed increases; the ordinary steam car may jump from a slow walk to a speed of thirty miles, with no detriment to the mechanism.

This "flexibility" does away with the necessity for a complicated system of transmission between the motor and axle, and makes it possible to place the engine just forward of the rear or driving axle, with direct connection by means of a

tion of the glass, as close as possible to the boiler, makes it visible only with difficulty from the driver's seat, a small oblong mirror is mounted near the dash on the front of the body, reflecting the water gauge; the gauge is lighted at night by a special lamp on the side.

On the dash or boot is the steam gauge, showing the pressure of steam in the boiler, and also a smaller pressure gauge showing the pressure of air in the air tank which forces the gasoline to the burner. Beneath the driver's foot is the brake pedal.

DEMANDS A DRIVER'S ATTENTION.

With certain things demanding constant attention, the driver of a steam car has, at the same time, but little in the way of delicate or complicated machinery to trouble him while under way. The mechanism as a whole is strong and simple, and with reasonable care in lubrication will do its work day in and day out, with little need of repair and adjustment, except at intervals, as in the case of all machines. He must, however, be con-

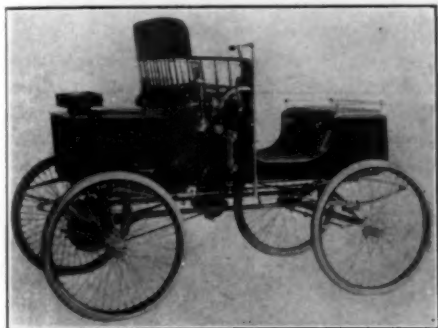
shocks to cylinder heads and chain, and to just steer clear of burning his boiler, but he will study the car and the road together, meeting the up-grades with good steam pressure, saving steam on the down-grades, always prepared for possible contingencies, and treating his car with the same consideration which a good driver displays toward his horse. This work is not only interesting in itself, but

It can pick its way in dangerous places or over rough ground at a slow walk, and it can easily exceed all legal speed limits, running up to a 30-mile speed on ordinary roads. A special element of safety, particularly in connection with the steep grades which it can surmount, is the utility of the engine, when reversed, as a brake. As a hill-climber, and also for rough roads, and no roads at all, it stands first. Some extra care is needed in freezing weather, but apart from this the car can be run in any climate.

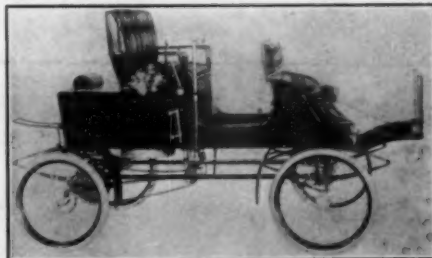
When it comes to speed in racing—a point of little importance to the average motorist—steam holds a high record for short runs on the level and on the hills. In a well-built steam car the machinery is fitted to stand all the work to which it will ordinarily be subjected for a long time, with no more repairs than the replacement of some of the parts; and while the vulnerable point, the boiler, is liable to be put out of use by one of those mishaps which, with the careful operator, are impossible in theory, but somehow do



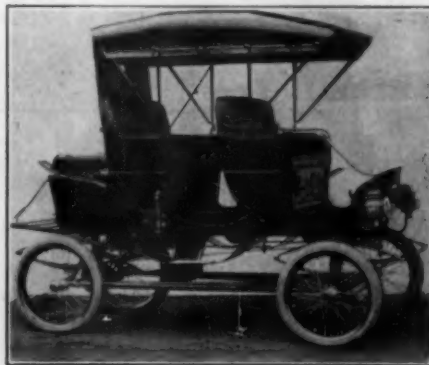
Steam Stanhope, 6 Horse-power, 1,200 Pounds.



Runabout with Box Front Extra Seat.



Runabout with Folding Front Seat.



Steam Surrey with Folding Top.

stantly on the alert as to the amount of water in his boiler, and the general running of the car. This may seem at the outset to be a formidable task, engrossing him to the exclusion of all pleasure and making the work dull and monotonous. So far from such being the case, the watching of the gauges soon becomes second nature, and is carried on without appreciable effort, while the sound of the exhaust and of the engine and the general "feel" of the car as a whole keep him informed as to the working of the machinery and the boiler.

While the operation of a steam car is really a simple matter and well within the ability of every intelligent man, there is really very much more to it than merely running smoothly and regularly without accidents. The enthusiast, whose ambition it is to become an expert operator, to keep his machinery in perfect condition, and to realize from it the highest possible efficiency and economy, will find a full scope for his skill. He will not content himself with learning to start and stop his engine, and to make all changes of speed in such a way as to avoid sudden



Six-Passenger, Box Front Wagonette.

SEVERAL TYPES OF AMERICAN STEAM CARRIAGES.

the result is shown in the satisfaction derived from a successful run, the freedom from breakdowns, and the moderate consumption of fuel.

ADVANTAGES OF STEAM CARS.

The steam car is quiet in its operation, smooth and even in its running, with little vibration; it possesses an extensive range of speed, and the speed changes may be made quickly and easily, without shock.

occur to all in practice; the damage is of a nature which may be easily and cheaply repaired.

AMERICAN DESIGNS RULE.

The American steam car, and with the single exception of the Serpollet, this practically means the steam car as used to-day in all parts of the world, has developed mainly on the lines of the shaftless carriage, and is best known in the form of the runabout, stanhope or surrey seating two to four people. The runabouts range in price from about \$750 for the lightest, to \$1,000 for a heavier and more substantial machine, fitted for general road work. The more elaborate Stanhopes run from \$1,200 to \$1,400, and the surreys from \$1,400 to \$1,600.

Riders and makers of motor bicycles will be pleased to learn that the trophy finally awarded to Werner Brothers by the Automobile Club of France for the regularity, reliability and speed of the Werner motor bicycles in the Paris-Vienna long distance race, was won in competition with automobiles of all classes, including the most powerful racing cars.

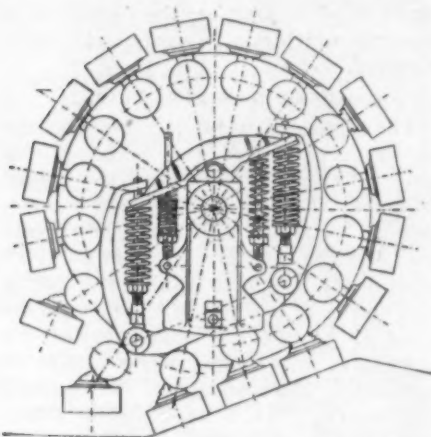
Traction Engine With Foot Motion Highly Praised.

Curious as looks the road locomotive shown in the accompanying engraving, which is reproduced from the *Automotor Journal*, it represents a new system of heavy goods transport on common roads, of which Professor Hele-Shaw, a well-known British authority on this phase of automobilism, speaks only words of highest praise in a report on the subject rendered after extensive tests. The system, known as the Pedrail system, is described in a book by B. J. Diplock, published by Longmans, Green & Co. From the *Automotor's* review of this work we take the following:

Here is a traction engine which actually and literally walks upstairs with the stride and sure-footedness of an elephant, and hauls loads behind it under circumstances which would nonplus an ordinary traction engine. Ruts, curbstones and boulders it makes nothing of, and even 9-inch baulks of timber are as stubble before it.

BRIEF DESCRIPTION OF PEDRAIL.

The Pedrail may be briefly said to consist of a rail somewhat in the form of an inverted heart, round which passes in succession a number of small wheels or rollers, each carrying a circular foot. Imagine a number of steel spokes to be all that remain of the ordinary wheel, each of these steel spokes having one of the rollers with the foot attached mounted on it. When the engine drives the axle carrying the spokes these feet are placed in succession upon the ground with the roller upward. The lower part of the heart-



WHEEL WITH ACCOMMODATING FEET.

shaped rail slides upon the roller which it finds beneath it until it has passed off the roller, which is then picked up and carried over to the front part of the rail in order to take its place again in supporting the vehicle.

The construction of the wheel is indicated in the accompanying drawing, showing it in the position of ascending an in-

cline. A disk is keyed to the driving axle and mounted on this disk are sixteen sliding spokes, to the outer end of each of which is pivoted the block-foot by a ball-and-socket joint. On the side of each



ELEPHANT-FOOTED TRACTION ENGINE.

spoke, projecting beyond the disk, is a small wheel or roller. The spokes are drawn inward by springs—not shown in the drawing—radiating from the center, one to each spoke.

Mounted on the axle-box is a rail pivoted to a flat plate or guide, forming part of the axle-box; the pivot of the rail is free to rise and fall in a slot in two springs, pressing against a top lever, pivoted to the top of the axle-box. The two inner springs only serve to steady the top lever. Two guides are provided to lead the rollers under the rail.

The whole of the levers and springs mounted on the axle-box come flat against the disk, so that the rollers, which project from the disk, are arranged around the guides and the rail as shown.

The disk, carrying the spokes, rollers and feet, revolves, but the axle-box, with its dependent lever, guides, rail and springs, does not revolve, with the result that a roller starting from, say the top of the disk, strikes on the guide and gradually forces the sliding spoke outward, thereby enabling the foot to turn on its ankle-joint by its own weight as it comes down, and to drop with its flat surface on the road, the roller then passing under the rail as shown. The bottom of the rail is slightly arched, as shown by the dotted line, so that the varying height of the rollers caused by the spokes being sloped or upright is neutralized, and the soles of

the feet present a uniform level surface to the road.

In regard to the work of this machine Professor Hele-Shaw says in part:

"The actual traction engine rested on two Pedrails in front and two ordinary traction engine (temporary) wheels behind, and proceeded to mount the steepest hill in the neighborhood. The points which struck me immediately were: (1) the marvelous ease with which it started into motion, and (2) the little noise with which it worked. I have never witnessed a traction engine, under any circumstances, move as quietly and with so little noise as the Diplock engine, nearly the whole of the noise appearing to arise from the two hind wheels. This fact speaks volumes, because noise is an immediate indication of vibration and wear of the working parts.

"Another thing which I noticed was the difference in the behavior of the feet and wheels. The feet did not in any way seem to affect the surface of the road. Throwing down large stones the size of the fist into their path, the feet simply set themselves to an angle in passing over the stones, and did not crush them; whereas the wheel coming after invariably crushed the stones, and, moreover, distorted the road surface.

"Coming to the top of the hill, I made the Pedrail walk first over 3-inch planks, then 6-inch, and finally over a 9-inch baulk, and photographs taken at the time tell more plainly than any words can do the behavior of this extraordinary invention under these circumstances. One could scarcely believe, on witnessing these experiments, that the whole structure was not permanently distorted and strained, whereas it was evidently within the limits of play allowed by the mechanism.

"As a proof of this, after having its photograph taken, the Diplock engine walked down to the works, and I then witnessed its ascent of a lane, beside the engineering works, which has ruts 8 inches or 10 inches deep, and was a steep slope. This lane was composed in places of the softest mud, and whereas the wheels squeezed out the ground in all directions, the feet of the Pedrail set themselves at the angles of the rut where it was hard, or walked through the soft and yielding mud without making the slightest disturbance of the surrounding ground. The engine then manoeuvred itself satisfactorily to its berth, where I witnessed experiments with its crane."

Automobile owners and drivers in Buffalo have been greatly annoyed of late by the theft of the lamps from their machines. This form of theft became so annoying that the police were called upon to break it up. One night recently a watch was set on a vehicle left standing in the street, whose owner was one of the greatest sufferers, and the arrest of a 12-year-old boy resulted.

ALL DELIVERY OF DRY GOODS BY AUTOMOBILE ONLY.

Leading exponents of thoroughly up-to-date methods in the delivery of dry goods in New York City are Saks & Co., who have recently built and opened a magnificent retail store on Broadway and Thirty-fourth Street, directly opposite Macy & Co.'s immense store. Every article sold in Saks & Co.'s store, except those packages which customers carry away with them, is delivered by electric vehicle. The firm does not use any horses, all of its work being done by two one-ton electric covered wagons and eight lighter delivery wagons of the same style, all ten manufactured by the Vehicle Equipment Co. In establishing a new store in New York

west of Broadway and Fifth Avenue from the Battery to Thirty-third Street.

Five of the lighter 1,000-pound wagons cover the rest of the territory from Thirty-third Street to Ninety-fifth Street, from Fifth Avenue west to the North River, and from Thirty-third Street to Ninety-second Street, from Fifth Avenue to the East River. Of the three remaining light wagons, one has the district from Ninety-sixth Street to 120th Street, from Fifth Avenue west to the North River, another that from 121st Street to 155th Street, from Fifth Avenue to the North River, and the third from Ninety-third Street to 145th Street from Fifth Avenue to the East River.

TWO AND THREE TRIPS DAILY.

All of the ten wagons leave the store

Manager Horn, of Saks & Co.'s shipping department, is most enthusiastic and stated that he is trying to induce the management of the store to make arrangements for recharging the wagons at the store, in order to save the trip to the stable for this purpose at noon, and also to prevail upon the firm to buy and manage its own stable for the vehicles, which he thinks would result in a considerable saving in expense and at the same time be more satisfactory in other ways. By owning its own stable and hiring its own caretakers, the company would insure the utmost attention to its own interests rather than to those of a third party. If the firm can arrange for charging the wagons from the lighting current in its store, this will result in a great saving of time, as such



GROUP OF SAKS & CO.'S ELECTRIC DELIVERY WAGONS LOADING FOR AFTERNOON TRIPS WITH DRY GOODS.

and bidding for trade in competition with larger and longer established houses, the firm evidently believed that the adoption of electric delivery of all goods would exemplify progressiveness and advertise their enterprise.

The ten wagons deliver only on Manhattan Island. The two heavy wagons were originally intended for the delivery of heavy goods, but since the store sells nothing larger or heavier than trunks, it was found that these wagons were not required for this special work and they were assigned to the downtown sections where other traffic is heavy and where they will command more respect from teamsters and motormen than the lighter wagons. One traverses the district east of Broadway and Fifth Avenue, from the Battery to Thirty-third Street, and the other that

for the first delivery at 8:30 in the morning. The seven downtown wagons make two trips daily, returning to the stable at noon to recharge the batteries, and starting on the afternoon trip at 1:30 o'clock, and the last trip at 5 P. M. The three wagons assigned to the uptown territory have farther to go and larger territory to cover, so that they make but two trips daily, the morning delivery beginning at 8:30 and the afternoon delivery at 3:30. All of the wagons complete the day's work and return to the stable at about 8 o'clock at night. No attempt is made to send any of them into Brooklyn or across the Hudson into Jersey City, Hoboken and Weehawken, as it is said the street pavements there are so bad that the batteries would soon be ruined by the severe jolting.

Regarding the work of the wagons,

charging can be done while the wagons are loading and they will not have to be withdrawn from service for an hour and a half in the middle of the day for the trip to the stable. Moreover, the waste of "juice" consumed in this noon trip will be saved.

COMPARATIVE SERVICE AND COST.

Mr. Horn, who was for many years in charge of the delivery department of Simpson, Crawford & Simpson's dry goods store, asserts that the automobile delivery service compares favorably with that of horses. Although he keeps no data of the work done by the vehicles, he estimates that each electric wagon accomplishes the same amount of work as a two-horse wagon, and the drivers claim that they make equal or better speed. It costs from \$16 to \$18 a month to feed,

stable and care for a horse, and from \$3 to \$4 a month to keep each wagon in good repair. The charging, care and storing of an electric delivery wagon amounts to about \$40, or practically the same as a team and wagon, says Mr. Horn. As to initial expense, a first class delivery horse costs \$200, and after three or four years of the "slam-bang" work, can be sold for about \$75, as unfit for further use by a first-class house. A good ordinary delivery wagon costs from \$350 to \$375, making the first cost of an outfit consisting of four horses and a wagon (the horses being changed at noon), from \$1,150 to \$1,175. The first cost of one of the 1,000-pound electric delivery wagons is \$2,400, while battery maintenance costs approximately \$300 a year.

In order to get the largest amount of service out of the electric wagon, there should be several reserve batteries, so that when one returns from a long trip, belated and with battery exhausted, a fresh battery can be placed in it and the vehicle will be ready to at once start out on another trip with a new load, the driver getting his lunch while the change is being made. With a horse-drawn wagon the horses can be changed quickly, while the driver snatches a few bites and a cup of coffee, and is then ready for another trip. Reserve batteries cost \$600.

In favor of the electrics are the facts that they do not run away, and that the driver does not have to stop to hitch them, to throw blankets over them in cold weather, nor put wet sponges on their heads in July.

Mountain Driving by Night.

Captain Fred M. Alger, son of General Russell A. Alger, of Detroit, has recently returned from an interesting trip in Europe, during which he covered 700 miles by automobile, going over the Alps at night. In speaking of his trip, he said: "The most interesting part of the automobile trip was between Trejus and Cannes, over a pass of the Alps by night. That was a glorious ride. The road winds in and out between the peaks and past the edges of precipices. We had only the light of our acetylene lamps going through the mountains, and I tell you it was exciting sometimes to see that narrow shaft of light traveling ahead on the road and then shooting off when the road turned, until we could see the tops of the pine trees and beyond them the blackness of space."

The City of Paris will give a gold medal to one of the exhibitors at the automobile show now in progress. The honor is a rare one, and will be sought with great eagerness.

An automobile encampment in Philadelphia is under consideration, the ground to be placed at disposal by the Philadelphia Commercial Museum.

Expert Discussion of the Oil-Engine Automobiles of 1902*—IV.

BY CAPT. C. C. LONGRIDGE.

FUEL AND IGNITION.

The consideration of the fuel used is a very important portion of the subject. A very great deal has yet to be learned. It seems to the author astonishing that petrol should have been so long in use and yet so little be known about it. He believes he is correct in stating that in this country at least neither the maximum explosion pressures of various petrol mixtures, nor the times of attaining maximum pressure, nor the rates of cooling are yet ascertained. Under these circumstances makers, as far as carburation is concerned, must be working more or less in the dark.

A few years ago Dr. Boverton Redwood contributed some valuable information on the subject. The results of his experiments tabulated in "Transport of Petroleum" are as follows:

"With seven volumes of the liquid (pentane and gasoline) to 100,000 volumes of air the combustion is a silent one, while with four times that proportion of liquid the mixture also burns without explosive violence. With between eight and nine volumes of liquid to 100,000 of air, there is a marked increase in the energy of the combustion, and, when the quantity of liquid is augmented to 10.5 volumes, a sharp explosion occurs. When the proportion of liquid is increased beyond about seventeen volumes, there is a perceptible decrease in the violence of the explosion, with corresponding gain in the volume and duration of the flame, and with twenty-one volumes of liquid to 100,000 of air the explosion is as mild as with 8.4 volumes."

These results, adequate for Dr. Redwood's purpose, are not sufficiently comprehensive for the requirements of the motor manufacturer. For his purpose, estimation of the value of any explosive mixture involves knowledge not only of the maximum explosion pressure as one factor, but also of the rates of cooling as another factor. It is only from the faculty of producing pressure and the capacity of resisting cooling that we arrive at the mean pressure which determines the true efficiency of the mixture. The determination of these factors is still wanting. It is, however, likely that the deficiency will soon be supplied, for the author is in a position to state that the necessary experiments are in progress. The results will be awaited with considerable interest, and there is little doubt that they will establish the value of petrol measuring devices for carbureters when efficiency and economy are rigorously followed.

But there is another phase of this prob-

lem requiring even closer research. Besides the determination of the fact that different petrol mixtures have certain rates of cooling, there is the ascertaining of the intrinsic reason, and why and wherefore of the facts, the relation of effect to cause, that is, the true knowledge or science of the problem. Attention is directed to this incomplete knowledge of the process of cooling, because it will be referred to again in connection with an interesting problem.

Under the head of fuel it may be noticed that the motor cars of to-day, more especially those of French makers, show a tendency to acquire greater range, that is, to be equally suited for the consumption of either petrol or alcohol. Is this a precursor of the supersession of the refined product of nature by the purely artificial production? That is a question for the chemists to decide.¹ There is, however, an interesting phenomenon which the trial of alcohol has made sufficiently prominent to merit attention. The point is clearly put in an article in *Engineering* January 10, 1902, on "French Spirit Motors": "In theory, the consumption of spirits for an equal power is 1.8 times the consumption of petrol; in practice, however, the presence of water in the spirits increases the elasticity and efficiency of the power, and the proportion is only as 1.25 to 1. . . . Spirit motors have more elasticity than petroleum motors and work more softly; the pressure of the explosion can be increased without disadvantage to the machine, the expansion curve being very regular. . . . It has been asserted, from results of tests carried out in Germany, that the efficiency of spirit motors is 23 per cent., against 15 per cent. for petroleum, and 13 per cent. for steam engines."

WATER IN ALCOHOL MOTOR.

Why should the presence of water in the alcohol motor give this increased efficiency? Before attempting a reply, it may be stated that the same phenomenon has been observed in the petrol motor; for, if the published reports are to be credited, the addition of water to the charge in the Banki engine reduced the consumption to 0.45 pints per brake horse power per hour. There again, in general terms, the advantages claimed were greater economy, greater elasticity and smoother running.

In July of this year, Mr. C. Rainey, at the author's request, made some experi-

¹The progress made, in Germany, in the alcohol industry appears from official statistics, showing that, in 1901, 30,624,000 gallons of denaturalised alcohol were used for technical purposes—motors, stoves, lamps, etc.

*From a paper read before the Institution of Mechanical Engineers in London, England.

ments with water injection in a petrol motor. Owing to want of appliances no very close work could be done, but the general results reported by Mr. Rainey are these:

(1) That, while maintaining the petrol supply constant, the addition of water gave increase of power and cooler running.

(2) That this effect was maintained until the water reached a quantity equal to the amount of petrol.

(3) That a larger quantity of water interfered with the sparking, and caused frequent failures of ignition, which, after a short time, failed altogether.

The whole question is obscure, and automobilists must not conceive the idea that even if water is proved to be a useful addition to the charge, the problem is at once solved. Probably correct employment of water will demand certain conditions that have yet to be studied and may require a change in the motor design. Anticipating the objection likely to be raised, that water will corrode the valves and cylinder, the author replies that this does not appear to be the case. With alcohol, containing water, it has been found that where the curve of the motor was regular, indicating perfect combustion, the condensation liquid of the exhaust was neutral and there was no attack of the valves and cylinder walls. Three years of experience with the Banki oil and benzine motors show no corrosion from the use of water. Nor is it likely that so experienced a firm as Priestman Brothers would have adopted water-injection if corrosion was to be feared.

FUEL ENRICHERS.

In another direction also, and this time with more definite knowledge and purpose, improvements in fuel are under consideration. These lie in chemical additions of explosive nature as petrol enrichers. The idea is not new and frequently recurs in past patents. There is no theoretical difficulty in chemically increasing the explosive power of petrol. But there are difficulties of a practical character which consists in finding an enricher that fulfils the two conditions—of not increasing the cost of the fuel per horse power; and of not introducing any element of danger in its use.

Picric acid has been experimented with, but it is manifestly dangerous to handle, and is said to leave a highly explosive deposit in the exhaust pipe and silencer. Bisulphide of carbon has been frequently suggested; but it will certainly need to be deodorized. Curiously enough salt also has been recommended. The effect of this ingredient, if any, would be due to the formation of chloride of nitrogen and hydrochloric acid, quite prohibiting its use. There are, however, other possible means of enriching petrol; and the author, in conjunction with H. J. Bult is now considering one of a promising nature.

METHODS OF IGNITION.

Next to the formation and constitution

of the charge come the methods of its ignition. Lamp ignition, except as a standby, may be said to have disappeared.

A little while ago some interest was excited by a new catalytic ignition. Such a method, however, has neither the flexibility, the inflammation capacity, the certainty, nor the suitability of properly designed electric firing. When it is recalled that incandescence is dependent on the concurrence of several factors into which the charge composition and governing of the motor enters, and that retardation and advancement of ignition are not nearly so perfectly controlled as with the electric current, enough has been said to indicate the weakness of this system.

The only method, therefore, to be considered in detail is the electric. This divides itself into dynamo, accumulators, magneto-electric or combinations. The dynamo is rarely used alone; more gener-

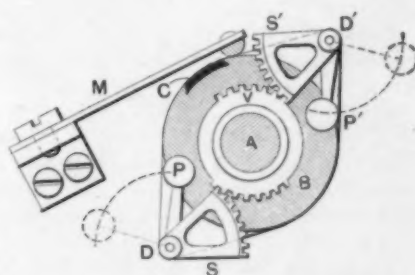


Fig. 1—AUTOMATIC SPARK CONTROLLER.

The fibre contact-breaker disc is mounted on a sleeve V, rotatable around the motor shaft A. As the speed accelerates, the centrifugal masses P P', pivoted on studs D D', are forced outward, causing partial rotation of the toothed sectors S S'. The motion of the sectors by means of the sleeve V, loose on shaft A, advances the position of the disc, so that the brush M establishes earlier touch with the contact plate C.

ally it serves to ignite the charge, while the surplus current goes to the accumulators, which are thus kept ready for emergency or for lighting purposes. This seems an excellent if not the best system. As regards accumulators the author's experience is that they never run nearly the mileage claimed and are otherwise troublesome. In this country, the best known magneto ignition is the Simms-Bosch. The Canstatt German Daimler Co. is said to have found the Bergmann Rotary Magneto-Electric apparatus very satisfactory. This produces alternating currents of low tension, and thus easy insulation; while the only moving part is the rotary armature. The magnets may be run at the same speed as the engine, and at very low speeds produce sparks of sufficient intensity. A method of low tension ignition, devised by Professor Burstall and fully described in the Proceedings of the Gas-Engine Research Committee, has an excellent record in stationary work. Professor Kennedy, chairman of the committee, and Professor Burstall kindly gave the author permission to test its value for petrol-car motors; but the author could not persuade the manufacturers with whom he was in

communication to take any interest in the matter, and cannot therefore state whether the apparatus would be equally successful for automobiles. In any case, as the invention of a clever scientist, a trial should prove instructive. So far the best induction coils are made in France.

In whatever form it is applied, electric ignition is a notable advance over previous methods. It provides absolute immunity against fire; it furnishes a spark well suited to explosive mixtures, it increases efficiency by enabling the charge to be fired at the moment of maximum compression, and it admits of the employment of higher compressions.

Existing systems of electric ignition admit, among other directions, of improvement on two lines—automatic timing and automatic consumption of current. The timing of the spark should automatically adjust itself to the speed of the engine. To illustrate this by an extreme case, assume a motor running at high speed and the spark set to pass at the moments of maximum compression; if suddenly, by the application of the throttle or other cause, the speed is greatly reduced, premature ignition will result, with considerable shock to the engine, crank-pin and bearings. But between this danger point and the period of correct firing is a gamut of speed variations, in all of which to maintain correct periodicity the timing of the spark should be altered. To repeat this in other words—for the matter is more important than many makers seem to think—with early ignition there is injurious strain on the engine, probable heating of the crank-pin, and undue wear on the crank-shaft bearings.

With late ignition there is considerable loss of power, high exhaust pressure with increased strain on the exhaust valve gear, incomplete combustion, sufficiently prolonged, perhaps, to cause gradually burning of the valves, and possibly back-firing of the fresh charge. With regard to the period of normal ignition, the author's own view is that it might be well so to dimension the compression chamber and stroke as to produce at the dead points slightly more compression than it is intended to use for explosion, thus allowing the crank to pass the dead point and gather way before igniting the mixture at the working compression point. On the indicator diagram, the explosion line, instead of being vertical, would then slightly incline toward the expansion curve. In any case efficient running greatly depends on accurate ignition, and should be treated accordingly. At present timing is mostly left to hand regulation by the driver; but attention is now being given to automatic spark controllers, one of which is illustrated in Fig. 1. A somewhat simpler device, designed by the author, will presently be noticed.

A second line for improvement is automatic regulation of the amount of current

used. Naturally this is of chief importance where accumulators only are used. At present the flow of current is usually made by a brush brought in touch with a contact piece on a rotary disc. If this contact is made of sufficient width to insure the passage of enough current when the motor is running at high speed, it will pass more than sufficient current when the engine speed is reduced.

To obtain automatic regulation of the current consumed, and of the time of sparking, the author has suggested using wedge-shaped contact pieces on the rotating disk, and allowing the disk under the direction of a governor an in-and-out movement on the shaft, Fig. 2. The action would be as follows: As the motor

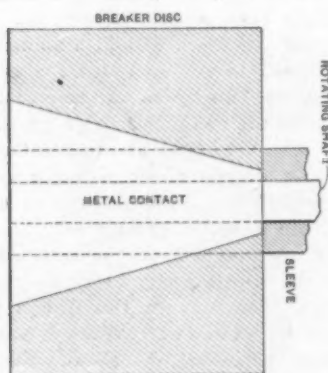


Fig. 2—CONTACT-BREAKER (Author's), FOR OBTAINING AUTOMATIC REGULATION OF TIMING AND CURRENT CONSUMPTION.

speed increased, the disk would slide, say backward, bringing the wider portion of the contact pieces under the brush; as the speed decreased the reverse would take place. This would give increased contact surface and earlier firing for high speeds with lessened surface and later ignition for slower speeds, that is, automatic regulation of current and sparking period.

Efficiency of the Worm Gear.

The interesting and valuable articles by Frederick A. Halsey, on worm and spiral gearing, published in the *American Machinist* two or three years ago, have lately been republished in booklet form by the D. Van Nostrand Co. as part of the Van Nostrand Science Series. The first of these articles was written mainly to refute the popular idea that the worm gear is necessarily a great waster of power, and only fit for light duty. Mr. Halsey shows, what has been amply confirmed by practical tests, that a well-designed worm gear is a very efficient mechanism indeed, it being quite possible, in fact, to obtain efficiencies exceeding 90 per cent. with proper design. What constitutes proper design is set forth with characteristic clearness and simplicity.

Plans are forming in Indianapolis for the annual local automobile show, which will probably be held in February.

Correspondence

"Pants for Cooling Streams."

Editor THE AUTOMOBILE:

Sir:—I want to ask an interrogatory, and you had "better be good to me," because I see my subscription is about to peg out, and renewal will be in order.

I have an Oldsmobile, and in an hour's time, if there is much running on the slow speed by reason of sand and mud, all the water evaporates—boils away in steam through the tank overflow; that is to say, to start with a full supply of water you get back with an empty reservoir. Distance, seven (7) miles.

What I want to know is: What's the remedy? Don't tell me to wait until the clouds roll by and the mud dries up; for, if you do — — — [an expletive asservation is here suppressed] if I renew!!

I have written the Olds factory, but was answered by some sprig of a clerk, to cut the hose, put in pipe connection, connect with city water works, and see if my circulation was all right. Then, if this was all right, then to take engine to pieces and see if anything was the matter there!

If you say anything like that, I'll only forward cash for six months.

Do all gas autos act thusly? Will the "slow speed" and rough roads heat up engine and waste water like this, generally?

I see that Haynes-Apperson, No. 34, in the A. C. A. endurance run, March 30, lost nearly three hours with hot engine, because belt came off pump. But my engine gets hot and the belt does not come off!

As soon as I can get something for my Olds, I want a tonneau! Four horse power be blowed; I want at least a dozen.

R. PETERSON.

Paris, Texas.

[Mr. Peterson is the owner and manager of Peterson's Theatre, which cost \$40,000 to build and seats 1,000 persons, according to Mr. Peterson's letterhead. Like most theatrical managers he takes readily to automobiles. We should advise him to buy the tonneau, but keep his Oldsmobile. A 2,500-pound, 12-horse power tonneau is as likely to "run hot" when going through sand on the slow gear as an 800-pound 5-horse power machine. So long as the trouble is with the too rapid evaporation of the water and not with overheating of the engine, the two or four cylinder motor of the tonneau machine should not present any advantage apart from its more constant torque at low speeds, and we agree with Mr. Peterson that his circulation is probably in good order, as otherwise the trouble would quickly be transferred to the engine. Considering the undeniable fact that several thousands of persons drive Oldsmobiles and have no complaint of the kind here referred to, we would suggest

that Mr. Peterson investigate the cylinder lubrication and the lubricating oil. The seat of the trouble may be there. Driving on the slow gear he may also get relief by throttling the engine as much as it will stand. Most drivers use a full charge whenever they are compelled to fall back on the low gear, but frequently a throttled charge would produce the same vehicle speed. A little study of the spark timing might enable Mr. P. to continue on the high gear in many instances when he does not do so now. In general it may be said that nearly all automobiles which have not been tried out in long distance races at top speed are too sensitive under low-gear driving. An increased radiating surface would be an advantage for obviating the results which are due primarily to faulty lubrication or unskilful operation. —Editor.]

Rural Mail by Automobile.

Editor THE AUTOMOBILE:

Sir:—Not long ago the rural mail carrier of Route No. 3, in this town, asked me to take him on his regular twenty-six mile trip with my Oldsmobile. He wanted to give his horses a rest and also see whether much time was to be gained by delivering the mail with a horseless carriage. I was willing and we got off one morning at 8:03 o'clock.

Uncle Sam, as you know, takes the right of way over everything, so we didn't stop to observe speed limits, and soon had the machine doing twenty miles per hour through the main street of the village. Over railroad tracks, through timbered sections, across bridges, along roads good and bad, up hill and down, the machine carried its burden of 400 pounds.

My companion had arranged his bundle in five smaller packages to make sorting easier en route, and yet he was kept busy with both hands and teeth, in order to have each farmer's mail ready for the box when we would reach it.

First I would turn up toward the box on the right; pull it open, shove in the mail, shut it again, and off to the next, perhaps giving my friend an opportunity this time to exercise his skill in doing the act quickly.

We kept this up, box after box, seventy-five of them; starting and stopping, and just once in our hurry did we put mail in the wrong box, which necessitated our turning back to replace it with the proper bundle. The carrier had selected the busiest morning of the week for this trial, so it surely gave us a test of what the machine would do any other day of the week, especially as the roads were not the best.

At one place, a new turnpike extending one half mile, was in construction. Here we were compelled to go out in the grass, through a "slough." Then followed three miles of sandy road, three to six inches deep, which made speeding impossible. The best roads we found were tracks made

by one wheel following another without a sod turned or work of any kind. Where they had ploughed up and scraped into the center, at some time or other, the going was quite rough and rutty. Such roads are a waste of time and money. What they should do is to haul on the road without ploughing it, until they are able to construct properly.

We were bothered very little by teams. However, it is aggravating to get behind a string of heavily loaded wagons, when the width of the road will not permit you to pass, and still more aggravating when the road is smooth and level.

As we pulled into town, we looked at our watches again to note the time we had made. The hands pointed to 10:29 A. M. This was two hours and thirty minutes better time than the carrier had ever covered the territory with a team, and practically one-half of the schedule time.

I think the test a creditable one. At one half-way house we added a little cooling water and oiled a few bearings, not from necessity, but to be on the safe side.

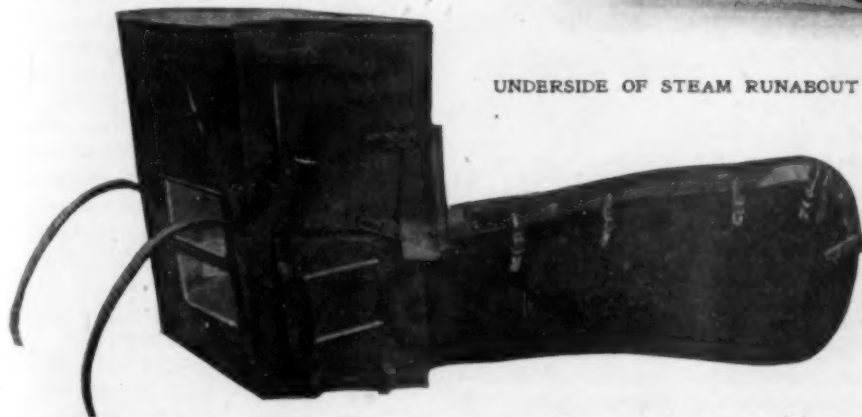
F. E. SHARLOW.

Montevideo, Minn.

Experience the Best Teacher.

EDITOR THE AUTOMOBILE:

Sir: In answer to your favor of December 1, I beg to say that I read your publication with a great deal of interest.



HOMEMADE LEATHER CASE FOR PROTECTION OF ENGINE AND CHAIN.

My experience with automobiles covers a period of about two years, and I might say that I am a satisfied user. I never expect to be without an automobile of some kind. If an intending purchaser were to secure the back numbers of your publication, and peruse them carefully, it is my opinion that it would be more profitable to him than listening to the average agent, who is interested in selling him. Nothing but actual experience in handling an automobile will ever teach a man what he wants. The machine I am using is a Haynes-Apperson surrey, and in my opinion meets their claims.

J. D. ANDERSON.

San Antonio, Tex.

Homemade Case for Engine and Chain.

EDITOR THE AUTOMOBILE:

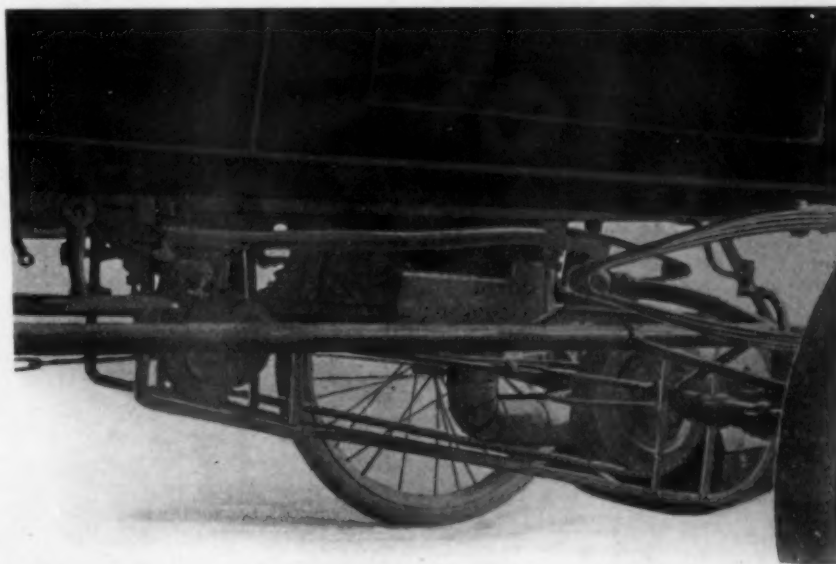
Sir: Ever since I have owned an automobile, I have found one great source of trouble to my machine, viz.: the chain getting full of dirt and mud, but was never so much impressed with the importance of having the chain clean as when on my trip through the mountains this fall, when for the whole twenty-seven days of my trip I rode in mud all the time, and at times had to stop and clean the mud off my chain to make it move at all, while all the time it made the engine do about twice the work it ought to have done.

I have wondered time after time why

frame the shape necessary to surround chain and engine; then I had a harness-maker make a leather cover over the frame, so made that it could be buckled on in a very short time.

After six weeks' experience with this, I would not part with it for five times the cost, if I could not make another. It is absolutely noiseless, looks neat and keeps the chain and engine clean at all times, whether running in dust or mud. It weighs twelve pounds, and has glass curtain lights in the front and on each side, so that the engine is light for oiling.

I enclose you two pictures, one showing the iron frame on the machine, and



UNDERSIDE OF STEAM RUNABOUT SHOWING IRON FRAME FOR LEATHER CASE.

the method of fastening it to the rear axle, and the other showing the case complete before putting on the machine. The two straps on the front are brought up to the wooden cross-piece of the frame of the machine and screwed in place, the iron frame holding the rear part taut. Where the water pipes and rear axle pass through it the leather was cut and a strap and buckle placed across the top of the cut. This makes the case easy to take off and put on, and handy to open for oiling the engine. The rear end can be raised to oil and adjust the chain. Over the top, underneath the burner, I placed a sheet of tin, bent the shape of the leather, so that the heat from the burner would not spoil the leather.

This case keeps the chain clean, and makes a great deal of difference in the running of the machine. As to cost, I did all the iron work myself, so did not estimate that. The time spent on it by myself altogether was about thirty hours. I paid for leather work, iron, etc., \$19.75.

N. H. K.

Ocean Grove, N. J.

It has been affirmed and denied that Henry Fournier will visit the Madison Square Garden show.

MOTOR BOATS

FRENCH CLUBS ADOPT LAUNCH RACING RULES.

ORGANIZATIONS CO-OPERATE.

Delegates from Fifteen Yachting Clubs, Meeting in Paris, Divide Launches into Service and Racing Sections and Adopt Experimental Rules for Classification of Boats.

The sport of launch racing has grown to such an extent among the various French yacht clubs within the past few years that the necessity for the consolidation of local interests in one association has been apparent for some time past. The final step to this end took place on October 28, when delegates from the various clubs met at the house of the Yacht Club de France in Paris. The following clubs were represented: Yacht Club de France, l'Helice Club, the Société des Regates de Pornic and that of Havre, the Union of Yachtsmen of Cannes, Club Nautique de Nice, Société de Duclair, Société Nautique de Toulon, the Cercle de la Voile d'Asnieres-Argenteuil, Sport Nautique du Havre, Sport Nautique de l'Oise, Société de Trouville, Société de la Voile at Vapeur d'Angers, Société des Regates de Poissy, Société des Regates Cannoises; all sections, from the Channel to the Mediterranean, being included.

Admiral Duperre, president of the Yacht Club de France, acted as temporary chairman, and after stating the object of the meeting, introduced Henri Menier, the well-known French yachtsman, so long prominent through his cruises in steam yachts, as the nominee for president. The Duc Decazes was elected vice-president; and Adrien Grenier secretary. The first question was that of the admission of the delegates from the river clubs, which was decided in the affirmative.

DISCUSSION OF CLASSIFICATION.

When it came to the questions of classification and measurement it was primarily decided to establish two divisions, service and racing, with different methods of measurement. Propositions for measurement rules had been prepared by Messrs. Forest, Levasseur, Lemarchand and Grenier, and on the suggestion of the president a special committee, including Duc Decazes, Count Recopé, Clerc-Ramoal, Caze and Desprez, was elected to consider them. During a recess the committee met and discussed the method of operation and probable time, and then reported that it would be prepared by October 30, to which date the meeting adjourned. The committee immediately met and took up the various propositions, as explained by their authors, and another meeting was held on October 29. It was decided to establish the service and racing divisions, and that the classification of the

former should include the volume of the cylinder as a function of the power; the number of passengers carried in the race, as a function of the useful work, and the least freeboard, as a function representing safety. The classification of the racing boats should be based on length only.

DOUBLE DIVISION ADOPTED.

The second meeting of the congress was held on October 30, lasting from 1 o'clock until 7.30 P. M., the discussions of different points being lengthy, though amicable. The delegates realized that they had a new and most difficult problem before them, and resolved to attempt nothing more than the determination of an experimental rule, to run for one year, in the expectation that the experience thus gained in many races would lead to a more perfect rule in the future. The report of the committee, read by Count Recopé, recommended the double division, which was adopted unanimously. It was further recommended that each launch should be fitted with a revolution-counter, whose readings should be recorded for reference. After some discussion this was adopted.

In the classing of the service division it was proposed that the volume of the cylinder be adopted as a basis, the classes being: All under 1 cubic decimeter of cylinder capacity, 1 to 1.5, 1.5 to 2, 2 to 3, and all over 3 cubic decimeters. Further than this it was recommended that each launch should carry in a race one person for every meter and fraction of a meter of length, and that the minimum freeboard should be three-hundredths of the length plus 20 centimeters (7 1/8 inches), a margin of 2 per cent. being allowed in new and 8 per cent. in old boats.

CLASSIFICATION BY CYLINDER VOLUME.

The proposition to class by cylinder volume gave rise to a long discussion, it being pointed out that this alone, without taking account of the number of revolutions, which might vary from 200 to 1,800 per minute, was a very imperfect measure of the power. While this was admitted by the committee, it was pointed out that it would be almost impossible to know before a race the number of revolutions which each motor would make, so as to measure it in advance. It was finally agreed that in view of this difficulty of actually measuring the revolutions it would be sufficient to accept the certificate of the designer as to the proper speed of the motor. On this several members suggested that if such a statement from the designer was to be accepted as the basis of classification, it might be well to go further and to take the designer's certificate of the horse power as based on certain cylinder dimensions, revolutions and other factors. This proposal met with approval and was finally adopted, the classes being fixed as follows: Not over 8 horse power, 8 to 12, 12 to 16, 16 to 20 and over 20 horse power.

The recommendations as to number of persons and minimum freeboard were adopted, with the proviso that a weight of 80 kilograms (176 pounds) of lead should be considered as equivalent to one person. It was further decided that no launch should be admitted to a race until her certificate of measurement was submitted to the race committee; this certificate to be furnished by the club on the request of the owner accompanied by the certificate of the builder as to engine dimensions, etc. It was also decided that the clubs should have the power to hold special races to the extent of 20 per cent. of the total prize fund. A rule was adopted barring from the races for a period of one year any launch which should race under other rules than those of the congress. The further editing of the rules in such minor details as could not be dealt with at the meeting was left to the yacht club. The work of the congress and the committee, and in no small degree of those individuals such as Messrs. Grenier, Forest and Lemarchand, who have given a great deal of time and labor to serious investigations of the measurement question, promises excellent results in the future, even though the present provisional rules may prove unsatisfactory.

Steam Yacht for A. C. Boswick.

Following the example of his father, who for many years owned the steam yacht *Oriente*, A. C. Boswick, of Mamaronck, N. Y., has ordered from A. Cary Smith & Barbey, a design for a steam yacht, and the vessel will be built this winter by the Harlan & Hollingsworth Co., at Wilmington, Del.

She will be of the new type of auxiliary schooner, such as *Genesee*, with which her designers have been so successful; in size and general model she will be similar to *Meteor III*, built this year for the Emperor of Germany, with the hull and rig of a sailing schooner, supplemented by steam power. The dimensions are, over all, about 160 feet; water line, 120 feet; breadth, 27 feet 6 inches; draft, 15 feet. The hull will be of steel throughout.

The engines will be of 200 horse power, and will be located amidship. The owner's quarters will be abaft the machinery space, and will be fitted for comfortable life aboard on long cruises.

The yacht will be ready early in the season and will be seen with the fleet of the New York Yacht Club, of which Mr. Boswick is a member.

E. A. Ely, the Middletown (Conn.) boat builder, has taken a fancy to the torpedo-boat style of stern for small launches and is laying out a 19-foot boat constructed on this model. The launch will be only three feet deep and is not expected to draw more than an inch at the stern. Mr. Ely anticipates a speed of eight miles with a 2 horse power motor.

LONG COASTING TRIP IN A MOTOR BOAT.

NOVEL CRUISE OF THE "WIZARD."

Extracts from Captain Adams' Log of His Inland Passage to Florida—Head Tide in Hell Gate—Hurricane Outridden—Boarded By "Nice" Tobacco Chewing Fisherwomen.

Special Correspondence.

NEW HAVEN, Dec. 15.—Captain George E. Adams and party, of this city, who sailed from this port on November 4, and are making a 1,200-mile run to Florida in the forty-foot motor boat *Wizard*, have been heard from at Southport, North Carolina, near Cape Fear.

The trip is of especial interest to motor boatmen, as Captain Adams is making use of sails to help him on the long runs of the voyage when the wind permits, and to keep the boat from rolling when in a sea-way. He has rigged a temporary short mast in the boat for this purpose and carries a "leg-o'-mutton" mainsail and a jib. It appears from extracts from his log which he has forwarded here, that the sail scheme works first rate, as it increases the speed, saves gasoline and makes the boat more seaworthy and comfortable.

The *Wizard* is a new boat and fitted with a double Lathrop engine (tandem) of 15 horse power, and a Foster reversible propeller. Captain Adams, who has his trip now more than one half completed, writes in part:

"The double engines work all right. The boat works finely with one engine in calm weather, and with a little wind for our sails we can easily make seven miles an hour. With both engines we made 105 miles on Pamlico and Core Sounds in eleven and a half hours.

THROUGH RARITAN CANAL LOCKS.

"The day we left New Haven, November 6, we made Port Jefferson. The next day we went through Hell Gate against a head tide, but we put the sails on and gave her full speed and that night we lay in the Raritan River, after a ninety-mile run. On the following day we went through the fourteen locks of the Delaware and Raritan Canal to Trenton. This canal is closed from 9 o'clock in the morning until 5 o'clock at night on Sundays. We had a northeast wind the next day and so we used the sails all day and one engine. Went from Bordentown to Delaware City, at the entrance to Chesapeake Canal. This canal does not open until midnight on Sundays. Passed through this canal and its two locks the next day, after rigging some backstays on the mast. Made fifty-five miles that day and reached the head of Chesapeake Bay.

RIVER OYSTERMEN'S "BUG-EYES."

"On the following morning there was half a gale from the northeast, but we set our sails and turned on the gasoline

and let her have it. Finally carried away the shrouds so that we had to reef, but we 'carried' on her until we reached the Patuxent River, where we anchored for the night, having made seventy-seven miles. There was a large fleet of oystermen there, mostly with the oddly-rigged 'bug-eyes,' schooners and canoes. They rake their masts away aft, claiming that in this way they get their sails lower down in the boat, and hence are able to stand more of a blow than if they carried them up in the air.

"On November 12 we bucked a fresh southwest wind and finally reached the beautiful land-locked harbor of Milford Haven, where we stayed for two days among old friends. The next day we made Fortress Monroe and Norfolk.

THROUGH DISMAL SWAMP CANAL.

"On this part of our trip we made about 475 miles in seven days' running, some of them short days, too; and we used about 145 gallons of gasoline. Friday, November 21, we put 150 gallons of gaso-



GASOLINE BOAT MAKING TRIP TO FLORIDA.

line aboard at 11½ cents the gallon. We then started up the south branch of Elizabeth River. Ran most of the way on one cylinder, as the river is very crooked, although it is well buoyed. Passed the old and new Dismal Swamp Canal openings, and went on up to the Albemarle and Chesapeake Canal. It costs \$1.50 to go through this latter canal. Through the Swamp Canal it costs \$5. Got into Currituck Sound the following day. In this sound the water is very shallow, and if we ran both engines the boat would draw a swell after her which held her back, so we used but one cylinder. The channel was well marked with tall pine bush stakes. Went through North River to Albermarle Sound and ran eighty miles under sail and one cylinder to Stumpy Point Bay on Pamlico Sound. There are about forty fishermen's families here. Large numbers of them came aboard and looked us over as rare curiosities. Some of the girls were nice looking, but the ladies all chewed tobacco or snuff and this did not materially improve their appearance.

OUTRIDING GALE AND HURRICANE.

"We entered Core Sound at 2 o'clock on the following afternoon, and grounded near Harker's Island Straits, although we floated the ship again after a little delay. Next morning we made Beaufort where we anchored. That afternoon we encountered the worst southwest storm I ever saw. You have nothing like it in the North. We saw the storm flag set, and so we got out both anchors with 200 feet of line on one, and 150 on the other. It blew a gale for three days, and the third day was the worst of the lot. But we had fully as bad a time at Bogue Inlet a day or two later. There we were held up for a week by a series of gales. On November 4 the wind there blew a hurricane from the southwest. We had one anchor in a creek and the other over back of the bank of a marsh. Both anchors dragged right home finally and we went afloat and drifted to the other side of the creek where we went ashore. Started the engines and made our way to another bank and put both anchors on the shore. Both were drawn close to the edge of the bank the next morning.

GOOD WILD GAME COUNTRY.

"We are having a fine trip. Friday I shot a wild pig weighing about 100 pounds. It is delicious eating. Gave a part of it to the captain of the three-masted schooner, *John Russell*, which lay near us. There are plenty of geese, ducks and rabbits about Bouge Inlet. On December 6 we started south again, and made for New Topsail Inlet. I found the channel had changed since last year, but we dodged between the breakers and got along all right. December 8 we set all sail, and, using both cylinders, went around Cape Fear through the Slue. It was very rough, but we 'bucked' it around to Southport. Our outside run is now half over. We passed lots of ducks and geese on the last day out, but did not kill any, as we were too busy climbing up one tall wave and sliding down the next."

New Gasoline Hunting Launch.

A 36-ft. hunting launch of special design, by Ernest N. Way, of Hartford, is now under construction by Elmer A. Ely, of Middletown, Conn. Her owners, Clarence H. Way and Frederick Reid, of Hartford, will use her for shooting and fishing on the Connecticut River and Long Island Sound. Mr. Way, who has designed several successful launches, has turned out a handsome design, from which speed is expected as well as sea-going qualities. The bow is fairly sharp, with little forefoot, the run is clear, and the stern is of the torpedo-boat type. She has a good freeboard, and with a low cabin house and a pole mast will resemble a sailing yacht.

The motor, a Howard four-cycle of 16 horse power, will be placed beneath the floor of the self-bailing cockpit.

CLUBLAND

BRIDGEPORT CLUB SECURES CONVENIENT NEW QUARTERS.

Special Correspondence.

BRIDGEPORT, Dec. 13.—Phoenix would be an appropriate name for the hustling Automobile Club of Bridgeport, for the organization survived a disastrous fire several months ago, and has a home again. The question of a future home was conjectural, until the special meeting of Tuesday night, and several propositions had been considered at "parlor" meetings of the members. However, W. S. Brandegee paved the way by erecting one of the finest automobile stations to be found between New York and Boston, in State Street, at a cost of from \$10,000 to \$12,000. At the meeting Tuesday night, J. B. Cornwall, Thomas Fish, F. I. Hitchcock, W. S. Teel, Jr., and F. T. Staples, the committee previously appointed to bring about a solution of the club room question, reported that it was settled satisfactorily to the committee and to Mr. Brandegee, and that the club was to have quarters in the new automobile station. The report of the committee was accepted with a vote of thanks. The club will occupy the front room on the second floor of the station, which is well suited to the purpose. The lease is for a year, with privilege of renewal.

GARAGE CLOSE TO PARLORS.

Hereafter, club members, by the provision of the contract, will have free storage at the station for their automobiles, not exceeding 48 hours at a time, and members may secure special rates for monthly storage. It was the sense of the members that it would be advisable to have the club quarters near where the machines would be stored. The club was never intended as a social organization, but was designed to promote the use of the automobile and the full enjoyment of the sport. For this reason elaborate quarters are not required. The room engaged has been handsomely finished with hardwood floor, ceiling and wainscoting. It has a fireplace and a window communicating with the main floor. The committee on furnishings, Dr. C. C. Godfrey and J. B. Cornwall, will equip the room with suitable chairs, tables, etc.

The members gathered around the fireplace after adjournment Tuesday evening and related some of their early experiences with the automobile. Frank Miller won approval when he said: "When a man has lain on his back on the ground under an automobile, and has been thumping pipes and tightening clutches, with the oil, grease and water trickling down his neck, and he gets into the machine and it goes, it is the proudest and happiest moment that can come to any human being."

ROCHESTER CLUB'S GRAPHIC ARGUMENT FOR GOOD ROADS.

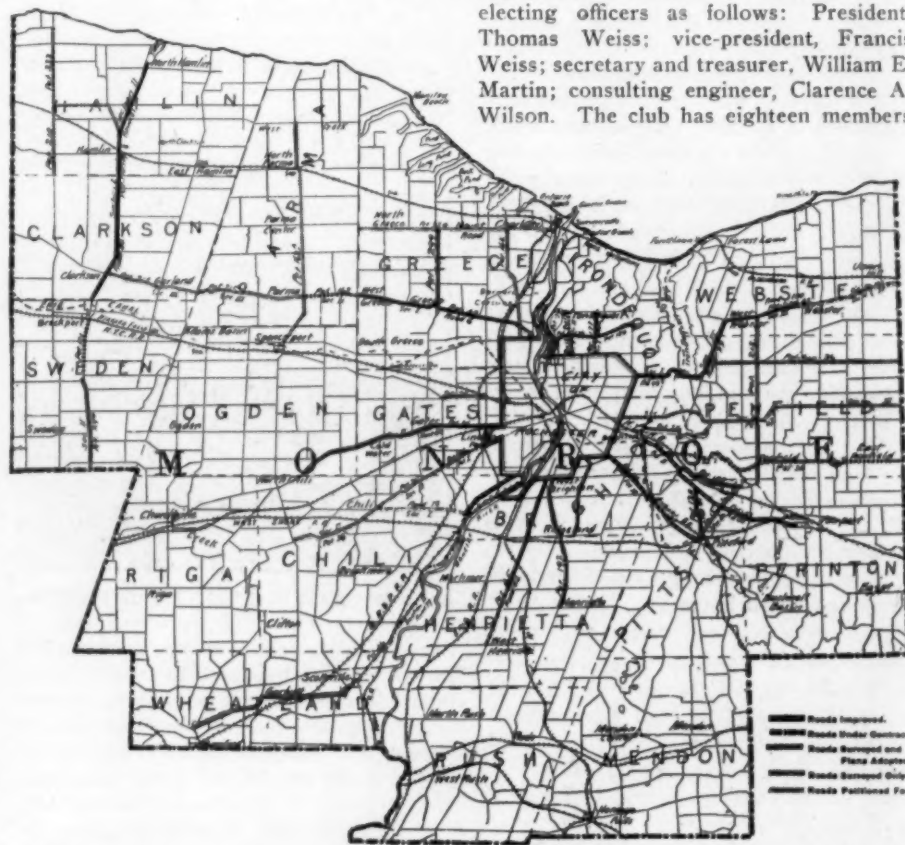
Novel and impressive is the method adopted by the Rochester Automobile Club to interest the citizens of Monroe County in the matter of street and road improvement and to enlist their aid. Sheets 25 by 17 inches, showing a map of the county, on which are indicated in five colors the improved roads, the roads under contract for improvement, the roads that have been surveyed and for which plans of improvement have been adopted, the roads that have been surveyed only, and the roads for the improvement of which petitions have been made, have been issued by the club, to be tacked to the walls in automobile, bicycle and other stores throughout the city of Rochester,

per \$1,000 of assessment for each mile of road, and the total cost to the town per mile of road.

By this table it is shown that rate per \$1,000 of assessment for each mile of improved road varied from 49 cents to \$1.14, and averaged about 77 cents per mile for every \$1,000 assessment upon each taxpayer and farmer. It is shown also that as the result of three years of work under the Higbie-Armstrong State Aid Act sixty-three miles of good road have been constructed in Monroe County. "In the next three years we can have one hundred miles more; let's keep at it," concludes the hanger.

Notes of the Clubs.

The Bethlehem Automobile Club was organized recently in Bethlehem, Pa., electing officers as follows: President, Thomas Weiss; vice-president, Francis Weiss; secretary and treasurer, William E. Martin; consulting engineer, Clarence A. Wilson. The club has eighteen members



ROCHESTER CLUB'S MAP OF MONROE COUNTY, N. Y., SHOWING ROADS IMPROVED AND TO BE IMPROVED.

and in all of the towns of the county. Above the map is printed an elaborate table showing for every town in the county the whole length of improved road within its limits, the contract price of improvement, the miles in each town through which the road extends, the proportion of cost to each town for its share of road, the share of expense paid by the county to each town and rate per \$1,000 of assessed valuation, the share paid by the town and rate per \$1,000 of assessed valuation, the share by the state (one-half) and the rate per \$1,000 of assessed valuation (nothing), the total cost to the town for county and town tax inclusive, the rate

enrolled and has temporary headquarters at the residence of President Weiss. Eleven touring cars are owned among its members.

The Syracuse Automobile Club has decided to hold a banquet in connection with its annual meeting in January and to invite prominent motorists of New York City to attend, with a view to forming a New York State association.

The Long Island Automobile Club has taken rooms on the ground floor of the Lincoln Club, 65 Putnam Avenue, Brooklyn. On Wednesday evenings it will have the privileges of the entire club house.

GASOLINE MOTOR FIRE ENGINE BUILT IN GERMANY.

At the recent exposition at Düsseldorf, Germany, the Deutz Gasmotorenfabrik exhibited the self-propelled fire engine shown in the accompanying illustration. It was built by Grether & Co., of Freiburg, except the motor equipment, which was supplied by the Deutz firm.

The motor is horizontal and adapted for the use of alcohol as well as gasoline, says *The Automotor Journal*, describing the main features of the construction, and is mounted above the rear axle where it can be controlled by the machinist who stands on the platform at the rear. The projecting shaft of the engine is provided with two clutches which engage either with the mechanism driving the vehicle or with the pump. The operation is alternative, so that when the engine is propelling the vehicle the pump apparatus is out of action,

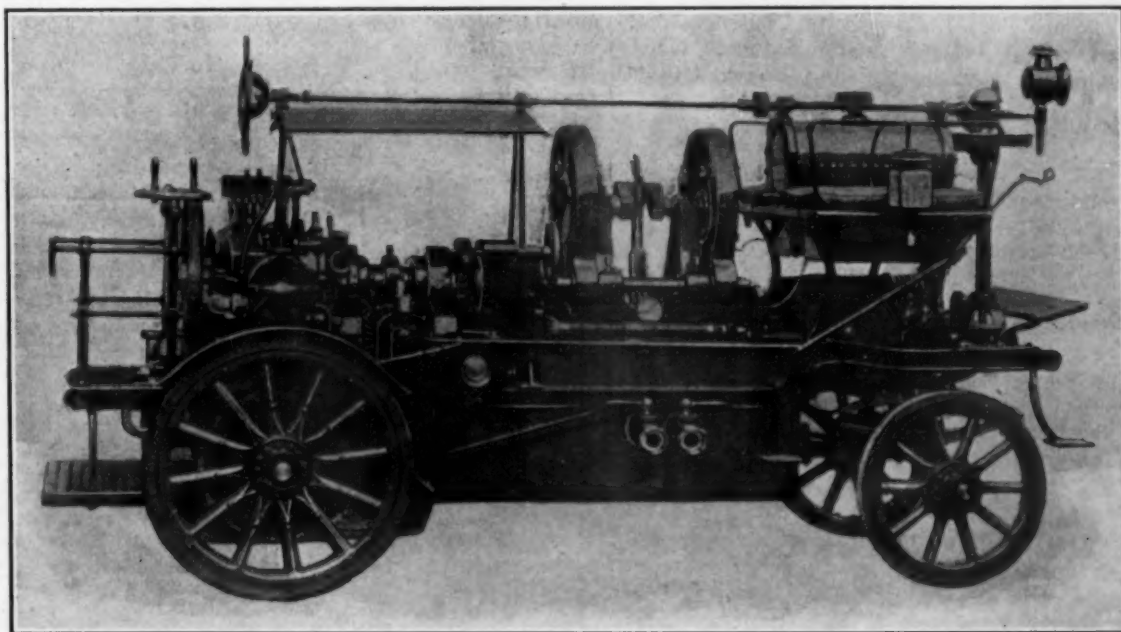
It is claimed that the rapidity of getting under way is the chief advantage of this fine-engine over steam fire-engines, the latter requiring a sensibly longer time to get on the road. The fuel reservoir carries sufficient gasoline or alcohol for continuous working for a period of ten or twelve hours, at an hourly consumption of 1 1-4 gallons.

Reference Work on Automobiles.

Under the title "The Automobile," Gerard Lavergne's "Manuel Theoretique et Pratique De l'Automobile Sur Route" has been translated into English and revised, with considerable additions as well, by Paul Hasluck. The treatise of M. Lavergne, published three years ago, comes as near being a standard treatise on its subject as is possible at the present time in so kaleidoscopic a field. Naturally, it devotes by far the larger part of its space to French practice. Of course, the lapse

ments in this line being represented by a brief mention of the Edison battery. Then the transmission system and the running gear are taken up, the subject being introduced by a chapter on the motor power required, which is largely theoretical but contains some data on road resistance from tests. The method of testing a motor by the friction brake is described, though nothing is said about the practical computation of transmission losses in an automobile, nor for that matter, are any useful figures given of the comparative tractive force required with iron and pneumatic tires. The descriptive chapters on transmission mechanisms, clutches, etc., are better, though insufficient recognition seems to be given to the fact that the sliding gear transmission is rapidly supplanting everything else in the continent from which the book comes.

The same criticism might be made of what is said about steering gears, since a



GASOLINE MOTOR FIRE ENGINE EXHIBITED AT DUSSELDORF EXPOSITION IN GERMANY.

and on the other hand the driving mechanism is completely out of gear while the pump is being operated at the scene of the fire.

The pump mechanism itself is situated between the front and rear wheels, and is mounted in the middle of the frame, being so arranged as to be easily accessible from either side. Seats for four are provided in front, these being on either side of the gasoline or alcohol reservoir. The necessary accessories and hose are also carried in front. The frame-work is of wrought iron and is carried by strong springs on the bearings of the axles. The motor is of the two-cylinder Deutz type, and it normally develops 15 horse power. It is provided with magneto ignition, enabling the engine to be instantly started.

of even three years has rendered much of its matter obsolete, and has brought forward new designs. The revised translation by Mr. Hasluck is as nearly up-to-date as the finite limitations of the book-maker's art will permit, and the translator has improved his opportunity to condense the original considerably in order to make room for more recent material.

After a brief historical chapter, followed by one on the several motive powers, the steam vehicle has two chapters devoted to its boiler and engine, only the English and French types being considered. The gasoline vehicle follows, with separate and quite complete chapters devoted to the leading styles of carbureters and motors, cooling and ignition being likewise considered. Storage batteries and electric motors follow, American achieve-

disproportionate amount of space is given to complicated and out-of-date devices, which are rapidly disappearing. The chapters on axles, wheels, and tires are very good, and the running gear generally is treated in a satisfactory manner.

Separate chapters are devoted to complete vehicles of the three leading motive powers, and also to the gasoline electric combination system: when the volume closes with a chapter of tabulated speed and efficiency tests and a short discussion of mechanical possibilities. A comprehensive index supplies a deficiency which was conspicuous in the French treatise.

The volume is published by David McKay, of Philadelphia. The presswork is exceptionally good, and the illustrations, numbering 536, are well drawn and clear. The price of the volume is \$4.50.

Foreign

BRITISH CURSE FROZEN CARBURETTERS AND SHOWS.

DISCUSSING DITHERING VALVES.

New Course Laid Out in Ireland for International Cup Race and New French Objections Expected—Engineering Firms Slow to Enter Automobile Industry—Too Many Shows.

LONDON, Dec. 6.—S. F. Edge, who takes and distributes the output of Messrs. Napier & Co., has set a most interesting discussion going in the columns of the English automobile press on the subject of automatic versus mechanically actuated induction valves for petrol engines.

Since the Mercedes people adopted the mechanically actuated induction valve, some eighteen months ago, many French houses have followed suit, save Panhard, who, having led for so long, are loth now to copy. And equally loth are the Napier people, who took pride of place with their triple nested valves which Panhard copied so as not to follow the German lead.

The strongest argument for gear-actuated valves, is that they cannot possibly stick down or up, or either on their seatings, as automatic induction valves do dither during the induction stroke. The supporters of the older system claim that there is more noise with the mechanically actuated valves, but this I fancy is more in imagination than in fact. I have heard Mercedes, Peugeot and other motors so equipped run with no more noise, if indeed so much as the engines served by the earlier type of valves.

IRISH COURSE FOR CUP RACE.

The secretary of the Automobile Club is once more off to Ireland to seek a course for the Gordon-Bennett Cup. As was to be expected the French Club took exception to the circuit course of 64 miles, which the secretary, Charles Jarrott, and R. J. Mecredy thought would prove acceptable to them. The French club will leave no possible point unobjected to, as it very naturally wants the race run off again in France. That a change of climate will be good for the health of this event I am sure, for it was rapidly assuming an altogether too Latinized character.

On this side we anxiously await news of the cars and men you will set in array to do battle for this cup. Nothing more fortunate for the American trade in this country than a Yankee victory in the G. B. race could occur. But to return to the race. I hear that the Secretary of the A. C. G. B. & I. has in his eye a straight-away course of 94 miles in the Green Isle, and if he finds this as suitable as the Paris-Innsbruck course of this year, well then if *Mepieurs les Français* want the G. B.

cup back at the Place de la Concorde they will have to come and race for it on Irish soil. That is, always presuming that by some means or other the present onerous legal position can be suspended for one day, and then only between the dawn and mid-day.

BIG FIRMS HANG BACK.

I regret to say that at present there are no further signs of any of our big English engineering firms picking up the manufacture of light medium-priced cars. The only folks I believe who contemplate so doing are the big Elswick firm of Armstrong, and if they only turn out as good automobiles as they do heavy guns, then we shall have something reliable and moderate in price from them.

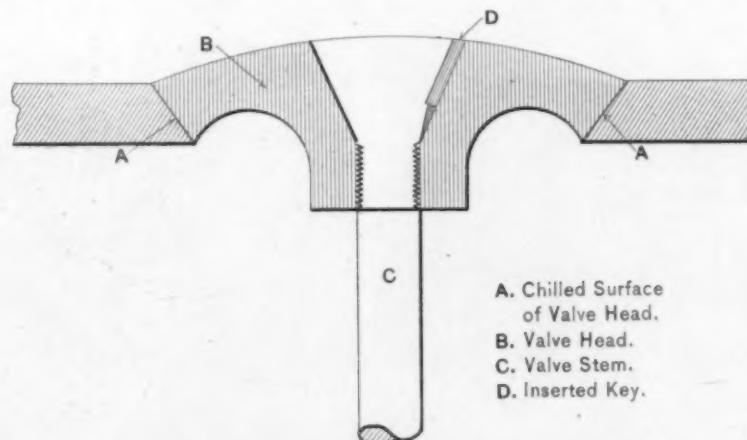
MANY SHOWS THIS YEAR.

Although in 1903 the trade will be asked to exhibit at no less than three exhibitions in London, there is, if one may judge by the tone of the speeches at the dinner of the Society of Motor Manufacturers and Traders, every chance of but one show

are suffering from frozen carbureters. Many makers in designing and placing what has been termed very aptly the boiler of the explosion engine have had little regard to this contingency. Hence these tears! An exhaust jacket to the carbureter would avoid all such evil, but in nine cases out of ten this is not provided. Consequently one meets men on the road, doing their best to thaw their instruments and cursing the short-sightedness of the man who lost sight of such a possibility.

Exhaust Valve Construction.

In a discussion of motor construction at the Mechanical Engineers' Institute in London, the designer of the Wolseley gasoline cars remarked that he had tried mild steel, nickel steel and cast iron for the heads of exhaust valves, but had found nothing to equal cast iron, but it must be of very close grain, and the seating face must be cast on a chill. To securely attach the head to the stem he had found a difficult matter, but he had finally



METHOD FOR ATTACHING VALVE HEAD TO STEM.

in 1904. Not too late the automobile trade is realizing that there is no sort of catch in being exploited, as the cycle trade of this country has been in the past by divers exhibition speculators. The show of 1903 is certain to be that promoted by the Society of Motor Manufacturers and Traders to be held at the Crystal Palace in the latter end of January, although it will be preceded by an exhibition of sorts at Earls Court run by the Stanley Cycling Club. I shall be astonished to find this latter show achieve anything but very qualified success, as the automobile trade as a whole are particularly jealous of the intermeddling of the cycle interest in their affairs. The motor exhibition to be run by the proprietor of the *Motor Car Journal* at the Agricultural Hall in May next, and which show received the *cachet* of the Automobile Club this year, will come too late to be of any real service to the industry or to the buying public.

FROZEN CARBURETTERS GIVE TROUBLE.

We are in the midst of a cold snap here just now, and automobilists, many of them,

devised the method shown in the accompanying sketch.

The valve head is drilled with a tapered and tapped bore, as shown, and the valve stem is threaded correspondingly. The parts are put together after heating the head to a dull red and the small key, D, is driven into the place prepared for it at the same time. To prevent the hot gases from impinging directly upon the inner edge of the valve, he placed a small baffle plate at the edge of the exhaust post.

The anniversary run by the Automobile Club of Great Britain held on November 8 to commemorate the "Emancipation Act," and of which a report was given in the November 29 issue of this publication, was also a non-stop test which proved quite severe on account of the rainy weather which prevailed. Out of 193 cars which started, very few followed the course to the end, but among those which did were two Locomobiles, and these went through without stopping, earning the club's non-stop certificate.

PRESENT FRENCH SHOW GREATEST EVER HELD.

NOVELTIES SHOW PROGRESS

Grand Palais Taxed to Utmost by Exhibitors and Visitors When Doors Opened December 10—Tendencies of Improvements—Full Reports Expected by Mail.

American manufacturers, agents and users of automobiles are taking more than their customary interest in the fifth annual French show which was formally opened in the Grand Palais in Paris on December 10 in the presence of President Loubet of France. The doors were thrown open at 10 o'clock, several hours before the President arrived, but a large throng of people was awaiting admission at that time. More Americans than ever who are directly interested in the progress of the industry sailed earlier in the month to attend the show, although the products of American factories are not strongly represented at the exhibition. The remarkable development of the industry and growth of public interest in it and in the new pastime and sport are exemplified by the fact that every available exhibition space in the immense building is occupied and many applicants for space were unable to gain admission, while on the opening day, from the arrival of the President at about 3 o'clock until the closing hour, the aisles were so densely crowded with spectators that inspection of the displays was most difficult and progress slow. The show, which is given under the auspices and management of the Automobile Club of France, will remain open until December 25.

Leading features of the exhibits, which mark the great strides toward improvement of the cars and indicate present tendencies are the wide adoption by French constructors of the Mercedes honeycomb radiator and fan, the Panhard reproduction of the electro-gasoline system in which the gasoline motor generates an electric current which is transmitted to the front wheels through electric motors, thereby doing away with transmission and speed change gears and overcoming the tendency to skidding, a Panhard motor with four separate cylinders to prevent heating and facilitate repairs, a C. G. V. car with an eight-cylinder motor so controlled by the admission of the gas that transmission gearing is dispensed with, several new styles of bodies including tonneaus that can be converted into entirely enclosed bodies either by removing the tonneau and substituting a brougham body or by attaching to the tonneau a top having glass sides and front, and improvements in the Gardner-Serpollet by which the flow of petroleum to the burner is automatically reduced as soon as the burner attains maximum heat.

A number of these new designs and im-

provements have already been described in this paper, and it is expected that full and accurate reports of the show will arrive by mail from our correspondents on the ground in time for the next issue.

So great is the anxiety for being in the fashion this year with regard to the honeycomb radiator with fan of the Mercedes pattern that one Parisian firm, Schneider & Co., which turns out this radiator as a specialty, does a good business in fitting it to cars of older construction, charging \$120 to \$150 for the remodeling.

Gobron-Brillié, a firm which has so far given small attention to racing machines, has under construction a 100 horse power vehicle which will be finished in time for the automobile festival and races at Nice in March, 1903. The motor is of the four-cylinder, eight pistons type.

French Racing Tricycle.

Though hardly known in this country, the racing tricycle is very popular in France, where some fast times have been



FRENCH 9-H.P. RACING TRICYCLE.

made by Osmont, Rigal and others. The machine here shown, the Korn tricycle, ridden by De Joostens in the last Ardennes circuit, is a very powerful affair, with a 9 horse power motor and two speeds, the engine running free. While Osmont was first on his De Dion machine, De Joostens finished second.

Friction Drive Bobs Up in Germany.

Ludwig Maurer, of Germany, has, after 13 years of incessant labor, devised a friction drive for automobiles which United States Consul Monaghan, at Chemnitz, honors with a lengthy illustrated description in one of his reports to the Department of State. The device is in its simplest form identical with that used for some time by an automobile company of Chicago, and now discarded for reasons obvious to most engineers. But this, of course, the consul at Chemnitz could not know. The device has also been tried and

discarded by four or five other American manufacturers.

It consists in a large friction disk mounted on the motor shaft and impinging against another disk, which may be pressed edgewise against it and can be slid laterally along its own shaft so as to be driven at any desired radial distance from the axis of the driving disk, thereby obtaining either high speed or low speed; or even reverse by sliding the driven pulley across the center of the revolving friction plate. The driven shaft is provided with a small sprocket pinion at one end, from which a chain transmits the power to the differential gear, which seems to be mounted on the rear axle or in one of the rear wheels. This old idea has been embraced by the Maurer-Union Mfg. Company, at Nuremberg, Bavaria, and applied to various styles of vehicles, including some of high power and weight. In the latter two driven disks are employed on the same shaft, but one seems to be an idler which merely serves the purpose of counteracting lateral pressure on the shaft of the driving disk. A fourth disk opposite the driving disk affords the means for increasing the frictional resistance by holding the two driven pulleys hard against the driving disk or friction plate. To this end there is a lever operating an eccentric cam, by which the shaft of the pressure disk may be moved slightly to and fro in its own direction.

WINTON IGNORES CHALLENGE BY OLDFIELD.

Special Correspondence.

CLEVELAND, Dec. 13.—Barney Oldfield has challenged Alexander Winton to a match race, but Winton will pay no attention to the challenge. He never races for money, and just at present he is engaged on his new racing car and has no time to give to making records against Oldfield. Under the recent decision of the American Automobile Association he holds the record for gasoline machines, but nothing could induce him to turn his attention now from his work of preparing for the international contest for the Gordon Bennett cup, which he has agreed to enter.

Some curiosity is felt among automobile manufacturers in regard to the construction of the Winton car to be entered for the Bennett cup race, as all previous Winton racing cars have exceeded the weight limit imposed by the Automobile Club of France for vehicles competing in this event. They must not weigh over 2,200 pounds. Doubts have been expressed lately, however, as to the competency of the French club to apply this rule to the International cup race for which the conditions were formulated before the new weight limit for heavy cars was declared.

The annual meeting and banquet of the Long Island Automobile Club was held last Wednesday in the new quarters.



VOL. VII.

NO. 16

Published Every Saturday
by**THE CLASS JOURNAL CO.**

395 BROADWAY NEW YORK CITY
Cable Address - - - Autoland, New York
Long Distance Telephone - 3405 Franklin, N. Y. City
Western Office:
356 Dearborn Street - - - Chicago, Ill.

SUBSCRIPTION:

United States, Canada and Mexico, One Year, \$2.00
Other Countries in Postal Union, - One Year, \$3.00

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Entered at New York Post-office as second-class matter.

SATURDAY, DECEMBER 20, 1902.

INTERNATIONAL CONTESTS.

At length it seems that our expert operators as well as our manufacturers of automobiles have come to appreciate the importance of taking part in the international event usually designated as the Gordon-Bennett Cup Race.

We learn from Europe that neither the English, nor the French, nor probably the Germans, entertain the slightest fear that any American contestant will be able to take the International Cup across the Atlantic. This complacent attitude indicates in itself why we should do our best to disappoint their expectations. The long distance race is not unjustly looked upon as the severest test of merit in construction and workmanship, and no other form of test can take its place as a means for convincing the world at large that we are not lagging behind in the industrial progress.

Our industry, in general, and those who are desirous of exporting automobiles especially, know well enough that an American victory in this event would mean trade expansion abroad and at home.

It would mean much more, however, than mere gain for the maker of the victorious machine. In France the national feeling of pride in the achievements of French manufacturers has undoubtedly consolidated her people in favor of the automobile movement and largely increased the number of motorists. In turn, this popular approval has prodded the industry to still greater efforts, and has impregnated constructors with a self-reliance fruitful of rapid improvements. Similarly a victory, or even an honorable second place, in a race recognized as the most important test between nations in matters

of automobile construction, would make every American feel more deeply interested and more personally concerned in the automobile cause, would turn the man who hesitates into a supporter of the movement, and would contribute greatly to solving the questions relating to the rights and duties of motorists on the highways and streets in a liberal and satisfactory manner.

On the other hand, it may be said that even an inglorious defeat—if such should prove the issue of our efforts—would do more good than harm, as it would point out our faults to the world and ourselves and force us to remedy them in quick order. We certainly would not consent to stand defeated for any length of time.

From whatever point considered, to stay away from the International test in passive disdain would be most impolitic. We must participate at all hazards, but it is devoutly hoped that all who have now offered to represent this country under the banner of the Automobile Club of America will leave no stone unturned to fit themselves and their machines for the trial in the most circumspect and thorough manner.

None of the machines which it is the intention to enter, has yet been completed, it seems, and all of them will be pitted against vehicles whose workmanship and construction have been tested abundantly. The time is extremely short for obtaining sound guarantees on the point of greatest, in fact paramount, importance. And this does not relate to pure speed, but to absolute reliability of all parts of the machine under the stresses produced by high speed. This country could poorly afford to send a vehicle abroad for this great event which might break down on the road from the strains of its own energy.

SIMPLE DRIVING GEARS.

Constructors of gasoline cars are drifting fast toward the abolition of variable gear mechanism. Electric transmission, as shown by the Panhard firm at the Paris show, according to cablegrams, is a step in this direction. This system was first tried by the Munson Company, of La Porte, Ind., several years ago. It is employed in Fischer trucks, made in Hoboken, N. J., in a modified form with auxiliary storage battery. Lohner-Porsche, of Vienna; Jenatzy, of Belgium; Champrobat, of Paris, and Dorticus, of New York, experimented with it last year.

More general confidence—though perhaps not better founded—is placed in the system by which mechanical transmission of power is employed while using a motor so powerful that no low gearing is necessary, and depending for variations of the vehicle speed entirely upon a wide range of motor speed produced by throttling of the explosive mixture, timing of the electric spark and braking by blocking the

exhaust. A car is said to be exhibited at the Paris show by Charron, Girardot et Voigt, in which this principle is adopted, though with one low gear, to be used when starting the motor only. This seems to be a development of the system of direct driving from motor to differential shafts when the high gear is in mesh, which was introduced in the Paris-Vienna models of French racing cars and did not prove absolutely successful at that time, but was subsequently found thoroughly practicable.

No doubt our manufacturers of automobiles are taking note of the tendencies here referred to, which seem thoroughly logical and well adapted to simplify the construction and operation of all gasoline motor vehicles intended for light and speedy traffic. For the transportation of heavy loads it may seem more doubtful if it will be practicable to dispense with the variable gear mechanism unless all pretension to speed is more deliberately sacrificed for this class of vehicles than at present.

NARROW ESCAPES.

For those whose brains and nerves are strong, and whose blood tingles in the veins with the exuberance born of successful activity, it is difficult to realize what painful shocks are inflicted upon timid, unintelligent or preoccupied persons by those occurrences which are termed "narrow escapes."

Whatever may be the true version in each case where a narrow escape is claimed, there can be no doubt that, for the present, a semblance of danger and an impression of recklessness are factors which mold public opinion and create hardships for motorists, almost to the same degree as really culpable action on their part.

The pedestrian who takes all kinds of chances in slipping by fast-moving horses and wagon poles or "flipping" on and off crowded street cars, receives a nervous shock when an automobile looms up closely before his eyes unawares, and complains vociferously. We may know that his sense of danger is due solely to his unfamiliarity with automobiles, and that it will disappear when his senses become accustomed to gauging their approach, and his mind shall have grasped the fact that rapidity of motion, under control, makes for safety by permitting a closer calculation of time and distance than is possible with bodies moving more slowly and irregularly. In course of time this will be appreciated by all, at least in practice, but just now motorists will serve the cause of mechanical locomotion best by not insisting altogether on what he knows to be true. Rather, make a broad allowance for the more or less faulty impressions and opinions which it is physically and mentally impossible for the general public to discard otherwise than by slow degrees.

INTERNATIONAL CUP RACE DRAWS MANY ASPIRANTS.

RULES APPLYING TO THE EVENT.

Automobile Club of America Will Decide Between the Candidates for International Honors by Elimination Tests, Public or Private—Chicago Club Has Two Willing Members.

Roused to realizing the need of quick action, the automobile industry and the Automobile Club of America have lately bestirred themselves to secure representation in the International (Gordon-Bennett) Cup race to be held in Europe next summer.

THE INTERNATIONAL RULES.

The rules of this event prescribe that entries can be made only by those clubs which are considered representative of an entire country and its industry, in the eyes of the Automobile Club de France, and also that the drivers of vehicles participating in the event must be members of such clubs. A member of the French or British clubs cannot, as such, drive an American machine. A member of the Chicago Automobile Club cannot drive an American machine, either, unless he is also member of the Automobile Club of America, as the French Club recognizes no other American club or organization, not even the American Automobile Association.

This was the main argument advanced a few years ago by the president of the Automobile Club of America for uniting all American clubs under the leadership of the New York organization and according their members recognition by it.

Other rules relate to the number of entries from each club, the construction of the vehicles and the racing regulations. Each country, or club, can be represented by one, two or three machines. The announcement of the number must be made before January 1 to the club under whose auspices the race is to be held, accompanied with a forfeit of \$600 to secure at least one participant from the entries announced. The race is held by the club whose representative won the trophy the previous year. In this instance, the Automobile Club of Great Britain and Ireland. If this club cannot hold the race on its own soil, the management of the event reverts to the French club, it seems. Each machine must be manufactured—lock, stock and barrel—in the country which it represents.

This last clause prevented England from competing in 1900 because the would-be contestants could secure no British-made tires in which they thought they could place reliance.

NO HEAVY CARS ADMITTED.

The racing regulations are those of the French club, which are generally adopted in Europe, and the French club decided early last year that a weight limit should

take effect in 1902 and thereafter according to which the large racing cars, previously unlimited in weight, must not exceed 1,000 kilograms (2,200 pounds). Subsequently, when ignition by magneto grew common, a slight extra allowance—of 27 pounds, according to the writer's recollection—was made for cars equipped with magnetos. The 1,000 kilo limit refers to the machines without supplies of fuel and water, but including ignition batteries and other necessary organs of the machine.

As reported last week the Automobile Club of America received an offer from Alexander Winton to represent the club and this country in this important event, and the club's racing committee has since announced the acceptance of this offer, though without mention of the name. It has also formally notified the British club that three contestants, representing America, will take part in the event, and has accompanied the declaration with the required forfeit of \$600.

Having already selected one color-bearer, the club has the task before it of selecting two additional ones and probably alternates for all three of them, making six in all, but the club is not compelled to make any selection unless its racing committee is convinced that those who are willing to represent this country abroad are also capable of doing justice to our industry and sport. With this in view, it has promulgated the following rules for the selection of contestants:

THE AMERICAN CLUB'S RULES.

Each entrant shall deposit with the club the sum of \$600.

The racing committee of this club will decide which of the entrants not yet accepted may compete in the cup race. This decision may be arrived at by a contest, or by the committee without a contest.

An entrant who is not nominated by the racing committee for the cup race shall have his entrance fee returned to him.

Any entrant who, after being nominated for the cup race by the committee, does not start, shall forfeit his entrance fee of \$600.

If three entrants are nominated to take part in the cup race, each entrant shall have two-thirds of his entrance fee—after deducting his proportion of the expenses incurred in holding the race—returned to him provided he starts in the race.

If two entrants only are nominated, each of such entrants shall have one-half of his entrance fee, after deducting his proportion of the expenses incurred in holding the race, returned to him, provided he starts in the race.

These rules are supplemental to the rules of the International Cup race, by which each entrant agrees to abide.

Following Mr. Winton's offers numerous communications have been received

by the club from others who are willing to enter the race. Among the names mentioned in this connection are H. S. Harkness, of Brooklyn, L. P. Mooers and W. T. White, of Cleveland, Percy Owen, of New York. The Automobile Club of Chicago has sent a letter stating that two members of that organization desire to enter also. Not all of these are members of the Automobile Club of America, but those who are not have been proposed as members, and action will be taken as soon as possible to remove objections on this point.

CONTESTANTS FROM OTHER COUNTRIES.

The French club has nominated two Panhard machines and one Mors machine for the contest, with alternates of the same types.

The German club either has nominated or probably will nominate three Mercedes machines.

The British club has nominated two Napier machines and will decide the third machine by tests between a Wolseley car and a Star. The Wolseley car, like the Winton, is equipped with horizontal motor, while all the others have vertical motors. The Star is copied to the last detail after the Panhard machines; it is said, and a British authority declares it superior in workmanship to its prototype. A Napier machine, driven by S. F. Edge, won the trophy this year, when the race was run from Paris to Innsbruck in conjunction with the Paris-Vienna contest.

COMPLETE REPORT OF A. C. A. RELIABILITY RUN ISSUED.

Advance copies of the complete report of the Contest Committee of the Automobile Club of America on the 500-mile reliability contest from New York to Boston and return under the auspices of the club last October have now reached the press in printed form. The report makes a book of 112 pages and contains, in addition to the report and recommendations of the committee, a detailed account of the performance of every car in the contest and an analysis of the results of the competition as a whole.

While this analysis by the Contest Committee is exhaustive in enumerating and classifying all the stops, the consideration of it in this publication is deferred till next week in order to make the treatment of the subject more commensurate with its importance and the vast amount of work represented in the report.

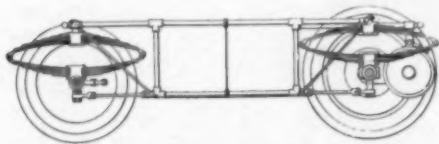
J. Dunbar Wright entertained the members of the Automobile Club of America at the Tuesday night smoker last week, with a talk on "Morocco and Algiers, with Glimpses of Spain," reciting incidents of his automobile tours in those countries. The lecture was illustrated with lantern slides.

Patents

Electric Vehicle Frame.

No. 714,808.—H. Lemp, Lynn, Mass., assignor to Elihu Thomson, of Swampscott, Mass.

A frame comprising a main rectangular frame with a lower frame suspended below it and rigidly braced for carrying the battery trays; this lower frame being approximately in the same plane as the axles, and distance rods being connected



FRAME FOR ELECTRIC VEHICLES.

from the said axles to the four corners of this frame, whereby elliptic springs may be used without danger of buckling.

Dust Deflector.

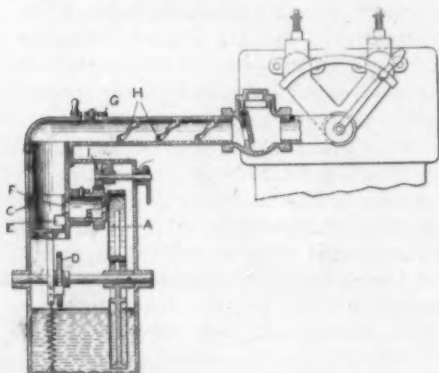
No. 712,825.—J. F. Mason, London, England.

An air deflector or screen supported on stanchions at the back of a motor car and having its top inclined forward at such an angle as to catch the wind of the vehicle's motion and deflect it downward and to the back, to oppose the suction of air at the rear which would otherwise carry dust up to the occupants of the rear seats.

Pneumatically Operated Carbureter.

No. 712,542.—T. B. Jeffrey, of Chicago, Ill.

This invention comprises pneumatic means for rotating a screen or disk, A, of wire gauze in a bath of gasoline, so as to bring fresh gasoline continually opposite the mouth of a suction orifice B. In



PNEUMATICALLY OPERATED CARBURETER.

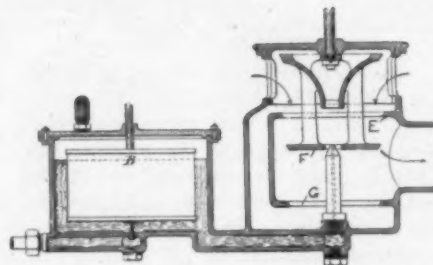
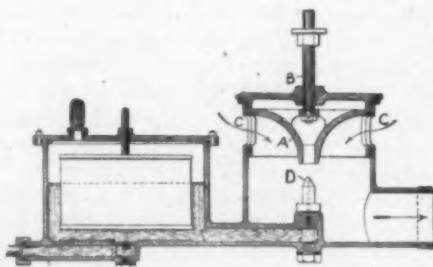
the drawings, the pneumatic device is a piston, C, connected below to a ratchet wheel D. The suction in the engine cylinder lifts C till the port E registers with a corresponding port F, through which the vapor may be drawn. Air enters at G, and a spiral baffle ring, H, assists the

mixing process. The aperture B is elongated, and the annuluse containing it may be rotated by the gear I, bringing B into a position to suck more or less of the gasoline from the screen. As the specifications do not speak of an air inlet into the casing containing the screen, it may be supposed that the vacuum produced therein by suction is supplied from the air inlet G before piston C descends.

Mors Carbureter.

No. 714,597.—E. L. P. Mors, Paris, France.

The special feature of this carbureter is the conical deflector A, which is connected to the stem B, movable from without by hand or governor, and which is intended to cut off simultaneously the air at C, and the suction of gasoline from the nozzle D. To this end, when it descends its apex fits over D, when the in-



FORMS OF MORS FLOAT-FEED CARBURETER.

gress of air is wholly cut off. Although the specifications do not say so, it is to be presumed that the effect on the gasoline of fractional cut-off of the air has been found to be proportional to the latter. A modified arrangement designed to balance the effect of suction on the force required to hold A in position, is shown in the lower cut. It is practically a double valve, with A seating at E, and F, which is connected to A, at G. When the valve is partly or wholly open, air impinges on F from both above and below.

Gas-Tight Inlet Valve.

No. 712,925.—C. O. Hedström, Portland, Conn.

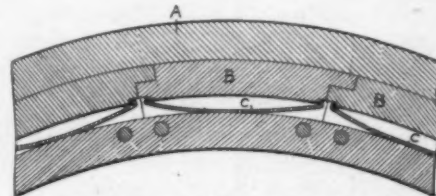
An inlet valve comprising a valve, a valve seat, and a bell to which the supply pipe connects. The bell has a bayonet joint for affixing it quickly to the cylinder head, and the mouth of the bell is internally threaded for the valve seat to screw

into it. The valve seat has a seating on the cylinder head, and when the bell is dropped into place a quarter turn of it simultaneously locks the bayonet joint and by virtue of the screw threading just mentioned forces the valve seat hard against the cylinder head, making a gas-tight joint.

Segmental Spring Tire.

No. 710,274. Everett Horton, Bristol, Conn.

This tire comprises a rubber tread A,



SPRING TIRE WITH RUBBER TREAD.

surrounding a segmental rim B, of a material not stated. The ends of the segments lap as shown, and each segment is backed by a spring C. Circular ribs or flanges, one on each side of the segmental rim and springs, prevent these members from escaping laterally.

Solid Rubber Tire.

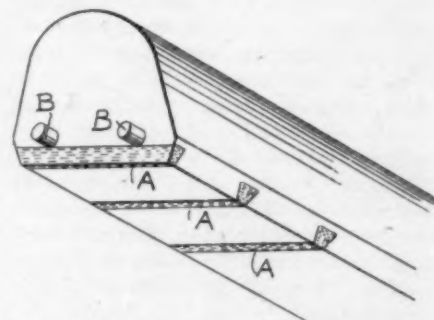
No. 710,971. C. W. Harris, Akron, O.

This tire contains transverse strips A A A, preferably of the dove-tailed shape as shown, and formed of plies of fabric and rubber vulcanized together. The purpose of these insertions is to prevent the retaining wires B B from cutting through the rubber at the base of the tire.

Miscellaneous Patents.

No. 711,454. W. J. Wright, Pittsburg, Pa.

A gas engine comprising a pumping and a working cylinder with both pistons working on the same piston rod.



SOLID RUBBER TIRE FASTENING.

No. 714,528.—J. E. Sprague, Portage Township, Ohio.

This device comprises two small drums to which the ends of the wires are attached and on which they may be wound, with ratchet wheels to keep them from unwinding. In the invention, the drums are located in a chamber cut in the wood rim.

INDUSTRIAL

PLANS TO MAKE CLEVELAND SHOW ATTRACTIVE.

Special Correspondence.

CLEVELAND, Dec. 13.—Many of the spaces for the automobile show, to be held in this city the week of February 2, have been taken by local and foreign manufacturers, although the Cleveland makers are in the majority, and inquiries have been received from many others who will doubtless make an exhibit. Applications for space are signed with three choices, so that in case spaces of the first or second choice are taken, the third may be assigned. The floor plan is so arranged that all the booths will have prominent positions.

The Cleveland Automobile Association is arranging for attractions which will bring out a good attendance. The officers expect to put into the affair about all the money they receive in order to make it a thorough success. An orchestra will be engaged for the entire time, and other musical features may be added. The show will be opened at 10 o'clock A. M. daily to the trade, and at 2 P. M. to the public. It will also be open evenings.

It has been decided to charge an admittance of 25 cents and probably season tickets will be issued at \$1.50, admitting the holder at any time and as often as he desires. It is believed that this will attract many who would probably not take so much interest in the affair if the regular price was charged for each attendance.

PROGRESS ON THE NEW LOCOMOBILE GASOLINE TOURING CARS.

Special Correspondence.

BRIDGEPORT, Conn., Dec. 13.—The gasoline car department of the Locomobile factory, which has now been in operation for several weeks, is running full blast, and its output will be greatly increased as soon as the parts of the cars have been completed in large numbers. The first Locomobile gasoline carriage was built by the Overman Automobile Co., of Chicopee Falls, Mass., which concern has since become affiliated with the Locomobile Company, and removed here, bringing most of its experienced men to take charge of the building of the gasoline vehicles.

The gasoline Locomobile, which is a handsome car, may be seen on the streets of the city any day, as two are at present in commission. One is the original carriage designed by A. L. Riker, which made a very creditable showing in the reliability run from New York to Boston, when it won a first-class certificate. The new designs will have a very high back to the tonneau body, which will aid in keep-

ing dust out of the rear of the car. A good feature is the absence of noise, the exhaust making only a slight buzzing or humming sound, rather pleasant than otherwise.

The gasoline department of the factory is under the supervision of A. L. Riker, William Perry, late of the Overman Automobile Co., is Mr. Riker's lieutenant. At present, there are ten of the gasoline cars in various stages of construction. The parts of the new machines are made at the factory, but so far cannot be turned out in as large numbers as parts of the steam carriages. Of the ten cars now being set up, three are for local purchasers, Dr. DeVere, H. Warner, W. C. Bryant and Senator-elect Archibald McNeil.

To Make Runabouts in Detroit.

Special Correspondence.

DETROIT, Dec. 13.—A stock company is being organized here under the name of the W. L. Marr Auto Car Co., to manufacture gasoline runabouts. W. L. Marr and J. P. Schneider are the inventors, promoters and incorporators. Mr. Marr has had eighteen years' experience in gasoline engine construction, the last eight being devoted entirely to the study of automobiles. Mr. Schneider conducts an automobile and bicycle business at 189 Jefferson avenue, where he has a sales, repair and charging station. The company is now building a sample machine, and it is expected that the Marr runabout, as it will be known, will be ready for the market about March 1. Aside from the points of lightness, speed, simplicity and durability, which it is designed to incorporate, the new machine has an original design of contact breaker that is protected from dust, a float-feed carbureter, single lever control, sight-feed oiler easy of access, wheel steering with new adjustable locking device and governor on engine.

Modern Garage for Milwaukee.

Special Correspondence.

MILWAUKEE, Dec. 13.—A \$10,000 structure for automobile storage and repairs is to be erected in this city. The T. Jonas Cycle Co. will let contracts for the building next week. The building will be two stories high, of stone and brick, and will be erected after designs similar to establishments in eastern cities. At present there is only one place in Milwaukee where batteries can be charged, and only a few places where automobiles can be repaired properly.

Theodore Jonas, president of the company, who has had the project in mind for some time, has been brought to a decision in the matter by the great increase in the number of automobiles in use in Milwaukee. Nearly sixty machines are now owned here, not including twenty-six motor bicycles. The automobile and motor cycle business in this city is in good condition, and not a dealer is to be found

who has a complaint to make. Most of them expect new models here within the next few weeks.

Los Angeles Enterprise.

The Auto-Vehicle Co., of Los Angeles, which was incorporated under the laws of California last May, is now located in a new two-story brick building, 60 by 120 feet, at 943 North Main Street. It is completely equipped with new tools. The first lot of twenty-five light touring machines will be ready for the market within three months. Most of them are already bespoken by local patrons. The company proposes to make a specialty of light delivery rigs, and will build heavy touring cars to order. The capital stock of the company is \$250,000, all subscribed by local parties. W. H. Burnham is president; I. B. Newton, vice-president; W. D. Longyear, treasurer; W. H. Allen, Jr. and W. F. Botsford, directors; C. S. Hartman, secretary and manager, and R. B. Haines, superintendent.

To Sell Pennington's Effects.

The personal property of E. J. Pennington, of airship and automobile notoriety, is to be sold soon by the sheriff in Racine, Wis., to satisfy a claim for several hundred dollars held against him by the proprietor of the Hotel Racine, who recently got out a warrant for his arrest. Only recently the announcement was made of the purchase by Pennington of the works of the Racine Boat Mfg. Co. for \$300,000, and the incorporation of the American Automobile Co., with \$5,000,000 capital stock, for the manufacture there of automobiles.

Automobile Makers Might Investigate.

The Singer Mfg. Co., of whose factories several are located at South Bend, Ind., offers for sale its original case factory, with the ten acres of ground on which it stands. South Bend is a city of 40,000 people on the St. Joseph River, 86 miles from Chicago, and is everywhere regarded as an ideal manufacturing center. Its factories employ over 8,000 hands. Taxes and appraisements are reasonable. The plant offered for sale is close to the center of the city and private tracks running into the yard and to the shipping building connect with the Lake Shore, Grand Trunk, Michigan Central, Vandalia and the Indiana, Illinois & Iowa Railroads.

A site is being sought in Niagara Falls, N. Y., by local automobilists for the erection of a handsome three-story storage and repair station. It is desired to erect this in some location that will be convenient to the hotels. The entire building is to be devoted to motor vehicles, and a large electric elevator will be one of the conveniences. It is hoped to make the building a rendezvous for local and visiting motorists.

NEW VEHICLES

The Upton Delivery Wagon.

Gasoline delivery wagons are now turned out by the Upton Machine Company, who have equipped a factory at Beverly, Mass., where they will manufacture complete motor vehicles of this type and also gasoline carriages of the French pattern with vertical motors in front and in several styles and sizes. The illustration shows a 20 H.P. delivery wagon, made for Houghton & Dutton, of Boston, and which this firm has found so well adapted for its purpose that they have placed another order for a delivery wagon, the new one to be of somewhat smaller size and power. The machine here illustrated weighs 5,000 pounds and carries a load of up to two tons.

The New Orient Motor Car.

The latest Orient Motor Car, shown in the accompanying illustration, weighs about 1,100 pounds. The wheel base is 80 inches, and the tread 4 feet 3 inches. The wheels are 30 inches in diameter, made with heavy wire spokes and heavy wood rims, making a very substantial wheel. The power is an 8 H.P. high-speed motor, making from 1,200 to 1,500 revolutions with carriage running at 18 to 25 miles per hour. The car is built for two passengers, but has an emergency seat in front which will comfortably carry two children, or adults if necessary. On ordinary roads it will attain a speed of

from 25 to 30 miles per hour. The operating mechanism is very simple and the carriage particularly easy to handle. The curved lever at the left hand side when moved slightly forward gives the geared speed ahead. By pushing it further forward it takes the high or direct speed. In this speed the carriage can be controlled by pressure on the foot throttle from 4 to 30 miles an hour. To stop and back the carriage, the curved lever is simply drawn back to its furthest point and will first check the carriage to a stand-still, and if still held, will cause it to run backwards. This car is made by the Waltham Mfg. Co., of Waltham, Mass.



ORIENT 8-HORSEPOWER RUNABOUT WITH FOLDING FRONT SEAT.

Steam Touring Car.

Binney & Burnham, of Boston, Mass., have recently delivered to Elliot C. Lee, vice-president of the Massachusetts Automobile Club, the steam touring car shown herewith.

As will be seen, it is handsome, roomy, beautifully finished and, according to the builders, it is a very powerful and serviceable car. Before being finished it was thoroughly tested, and was found to climb hills of steep grade at a very fast pace, and to have a running gear that would stand much abuse and hard roads.

Among the mechanical features of this car the following may be mentioned:

The gasoline tank holds 14 gallons, the water tank 48 gallons; both are of pressed steel. One water pump is run from the engine shaft, an auxiliary one by hand, and a Victor steam water pump is controlled from the seat. The hand air pump and the Victor air pump are operated from the seat. The lubricator is of the Pony Rochester pattern which is adjusted by the engine speed. A McNutt steering gear is fitted either in the center or sloping and on one side, at option. The throttle has a snap lock and an auxiliary throttle is used.

White Company's Delivery Wagon.

The mechanism of the White company's delivery wagon is practically the same as that of the standard White carriage. It has a 6 horse power engine with 8 horse power flash boiler. The engine is encased in a splash oiling device and to the crosshead of the engine is attached the pump for the condenser circulation. The vehicle is not intended for heavy loads, but about 800 pounds of packages can be carried in the two shelves with which the body is provided. The total weight of the vehicle is 1,600 pounds.

It is stated that a touring car will be one of the models of the White Sewing Machine Co.'s line for 1903, but the com-



UPTON 20-HORSEPOWER GASOLINE DELIVERY WAGON IN USE IN BOSTON.

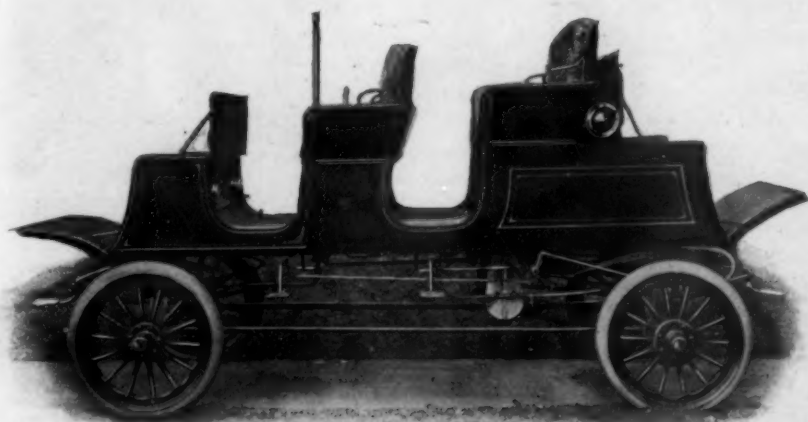
pany is not yet ready to give out details regarding it.

New Conrad Surrey.

The Conrad Motor Carriage Co., of Buffalo, N. Y., is building a new model of surrey, shown in the accompanying illustrations, which will accommodate either four or eight persons. The wheel base is 10 feet 2 inches, with 4 feet 8 inches tread. The boiler is 19 inches in diameter, the engine is entirely encased and runs in an oil bath. In addition to a large water pump on the engine taking the full stroke, independent steam, air, and water pumps are fitted. The engine is 3 1-2 by 4 inches, and is rated at 10 horse power. The water-tank is of the full width of the seats, and the gasoline tank carries 15 gallons; both tanks are fitted with hub brakes. The



CONRAD EIGHT-PASSENGER 10-HORSEPOWER STEAM SURREY.



EIGHT-PASSENGER SURREY WITH EXTRA SEATS OPEN.

front seat is 36 1-2 inches wide, the operating seat is 44 inches, the third seat 45 inches, and the rear seat 36 1-2 inches. A steam syphon fills the water tank.

Travelers returning from Europe are mentioning the latest models of Clément voiturettes with much praise for their style and convenient operation. One of these vehicles was recently imported by Bernhard Schultz, of Zanesville, O. Mr. Clément will visit this country in January, taking with him several of his cars for the Madison Square Garden show. When Mr. Clément was here last year he established a factory for motor-cycles in Hartford, Conn. Since then he has made arrangements for two factories in England, one of them near London, the other for heavy vehicles in Yorkshire.



BINNEY & BURNHAM STEAM CAR WITH FOLDING FRONT SEAT OPEN.

New Enterprises.

The Colorado Automobile Co., of Denver, has been incorporated for \$50,000, by George W. Wood, M. W. Gano, Frank R. Ashley, Alvin B. Daniels and Lewis Lindahl.

Certificates of incorporation were filed at Dover, Del., recently, by the Standard Motor Vehicle Co., with capital stock of \$1,000,000, to manufacture, buy, sell and deal in motors, vehicles and parts.

The Cook Motor Co., of Delaware, has been admitted to do business in Ohio. It has a capital stock of \$50,000. The incorporators are Charles E. Cook, Fred C. Cook, Leonard L. Denison, William S. Denison and John F. Denison.

Articles of incorporation have been filed by the People's Rapid Transit Co. in Providence, R. I. This company will operate automobiles between Westerly, Watch Hill and White Rock in Rhode Island.

The Damascus Nickel Steel Co., of Pittsburg, Pa., has recently been reorganized and incorporated, with \$1,000,000 capital, to take over the Nickel Steel & Forge Co. The company is to erect a large mill, with a much greater capacity than before.

The Secretary of State of Maine has approved the application of the Country Club Car Co. for a charter. This is a corporation organized with a capital of \$400,000, at Kittery, Me., to deal in automobiles and other vehicles. The officers are: Albert E. Knowlton, president, and Charles C. Smith, treasurer, both of Kittery.

The Bon-Ton Automobile Co. has been incorporated in Maine, with \$500,000 capital stock, for the purpose of manufacturing and dealing in motor vehicles. The officers are as follows: President, Horace Mitchell, Kittery; treasurer, John M. Heath, 284 Maple Street, Lynn, Mass.

A new factory is being erected at Batavia, N. Y., for the Sweet Tire and Rubber Company. When it is completed the capacity will be two tons of tires per day by a working force of forty to fifty operators. Mr. Richardson, the president of the company, states that their new automobile tire will be ready for the market in the spring of 1903.

Incorporation papers have been taken out for the Bristol Motor Car Co., which will manufacture a gasoline run-about. The organizer of the concern is Frederick N. Manross, of Forestville, and the other stockholders are from Bristol and Springfield, Mass. The capital stock is \$10,000, and the parts of one machine are practically ready for assembling.

Application has been made in Atlanta, Ga., for a charter for the De Leach Vari-speed Co., with a capital stock of \$100,000 and privilege of increasing this to \$1,000,000. The purpose is to manufacture auto-

mobiles and motors. Work of organizing the company and erecting a plant will begin as soon as the charter is granted. The incorporators are A. A. and V. H. De Leach and William Owens. The general office is to be in Atlanta, and the factory in Fulton County.

Trade Brevities.

The Worthington Mfg. Co., of Elyria, O., denies the report that it contemplates undertaking the manufacture of automobiles of any kind.

The Bellefontaine Carriage Body Co., of Bellefontaine, Ohio, has been succeeded by the Buckeye Carriage Body Co. of the same place.

The Shelby Motor Car Company, successor to the Beardsley & Hubbs Mfg. Co., has added a third story to the factory and enlarged the main floor.

Smedley & Co., forwarders and truckmen, of New Haven, Conn., have added a new electric drag to their outfit of motor vehicles. It will carry forty passengers.

The General Automobile Co. of Cleveland has brought out a new car for next season that is said to be a great improvement over previous vehicles made by the company.

The Mobile factory at Tarrytown, N. Y., has been closed for inventory and repairs. Later, manufacture will be resumed and Mobiles turned out in larger numbers than ever before, writes Manager E. B. Gallaher.

Stockholders of the Geneva Automobile Mfg. Co., of Geneva, O., at a recent meeting voted unanimously to increase the capital stock from \$100,000 to \$150,000, the increase to be in 7 per cent. cumulative preferred stock.

The Kirk-Snell Co., of Toledo, Ohio, has shipped fifty of its new machines to Chicago. It is the purpose of the company to go into the business on an extensive scale next season. Its machine is an eight horse power gasoline touring car.

The American Cycle Co., at Providence, R. I., has leased property at Pine and Garnet Streets, for an automobile station. The plans call for 5,000 feet of storage room. This station will adjoin the quarters of the Rhode Island Automobile Club.

Hodge Brothers Co., Pasadena, Cal., have fitted up one of the finest automobile storage, repair and charging stations in the West. They are prepared to handle electric, steam or gasoline cars, and have workmen used to repairing each of these classes.

Ernesto G. Fabbri, W. J. Arkell and D. Dodge, all of New York, are reported to have bought 16-H.P. Rochet-Schneider cars. Raymond Hoagland, also of New York, has purchased a 40-H.P. Mercedes car at the Fisher agency.

During show week in New York the National Association of Automobile Manufacturers will hold a banquet for members and invited guests at the Waldorf-Astoria hotel on January 23. The annual meeting of the association will be held the following day.

For the ten months ending with October this year exports of automobile goods from New York were \$970,610 in value, as against \$262,537 for the same period in 1901. The total yearly exports of bicycles when at the highest amounted to about \$7,000,000.

The Boston quarters of the Locomobile company will be removed to No. 13 Berkeley Street before the close of this month. The new building is arranged especially for the automobile business, comprising basement for storage, ground floor for salesroom and offices, and the upper floor for stock room and repair shop.

Kenneth A. Skinner, the United States agent for De Dion et Bouton automobiles and component parts, sailed on the *Kaiser Wilhelm* on December 2 to attend the Paris automobile show. He has arranged to bring the entire exhibit of the De Dion firm to this country for the Madison Square Garden show in January.

George W. Houck, of the Houck Automobile Company, London, Eng., is reported to have placed an order with the International Motor Car Company, of Toledo, O., for \$125,000 worth of this company's 18 horse power gasoline touring cars, \$50,000 worth of Toledo steam vehicles and \$75,000 worth of Waverley electric carriages. The new model gasoline car differs from those first made in having a throttling-governor instead of a cut-out governor, in conformity with the latest approved practice for high class automobiles of this type.

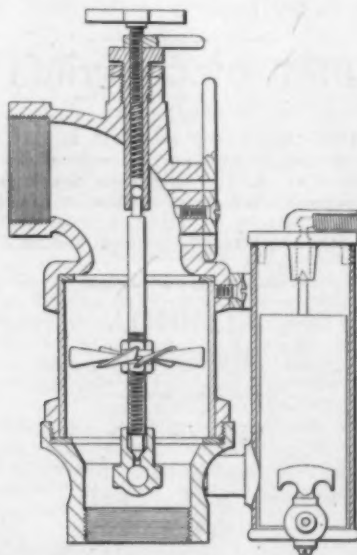
Cleaning King's Spark Plug.

A. W. King, of Maywood, N. J., informs this publication that the description of the "Non-Stop" spark plug contained in last week's issue was at fault at one point. He states that the contents of the cylinder may be blown out between the sparking edges of his device—cleaning the same of deposits—without stopping the engine or disconnecting the electric current, while it was stated in this publication that it should be done "preferably with the electric current disconnected." Mr. King considers this point very essential to the merit of the plug. The writer of the description had in mind the avoidance of a blast of fire in close proximity to the hand operating the relief cock, which necessarily must be turned open at the last moment in order to secure the compression in the cylinder to which Mr. King refers in his own description of the plug.

INFORMATION FOR BUYERS.

HOT AIR CARBURETER.—The sight-feed "gasifier" designed by Arthur R. Mosler, 309 Broadway, New York, belongs to that class of carbureters by which throttling of the explosive mixture affects the proportions between hydro carbon gas and atmospheric air, but not the total quantity or the compression. The main air inlet is supposed to carry hot air for

be raised higher or lower according to the adjustment of the spring and the force of the suction. At slow speed the motor will therefore automatically draw in a weaker mixture. The auxiliary cold-air inlet has the form of a perforated disk. By rotating this disk, by means of a lever, the mixture may also be throttled by hand, the larger admission of cold air re-

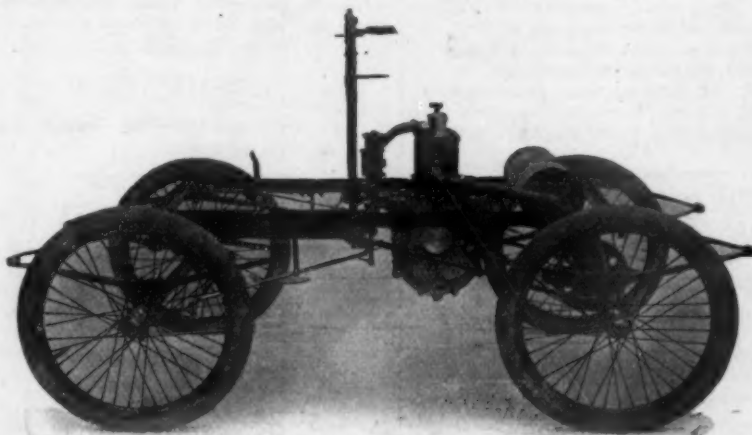


EXTERNAL AND SECTIONAL VIEWS OF MOSLER CARBURETER.

the evaporation of the fuel, but when the motor is being started with cold air the closing of the auxiliary air inlet will produce a spray mixture of greater richness in fuel which will serve the purpose. In the float chamber the usual order is reversed. The gasoline is admitted from the top. The needle valve on top of the float is pressed upward to close the flow when the proper level has been reached. The chamber has a drain cock below and a lateral outlet to the mixer. This outlet is controlled

during the lift of the fan and admission valve. The connections of these gasifiers are made to fit any standard thread from 1-2 inch for motor cycles up to 3 inches for stationary engines.

RUNABOUT FRAME FOR ASSEMBLERS.—The Holley Motor Company, of Bradford, Pa., offers to supply a frame and running gear, fitted with complete motor and driving mechanism, from which a 600 gasoline runabout may be completed by adding the carriage body work.



HOLLEY RUNABOUT CHASSIS READY FOR BODY.

by a separate needle valve with lock nut adjustment. The mixing chamber has a transparent mica shell through which the operation of the mixing fan may be observed. The suction stroke of the piston will raise the fan against the resistance of the finely adjustable helical spring abutting against the upper end of the fan shaft, at the same time revolving the fan and lifting the needle valve which forms the lower point of the shaft, so as to admit gasoline from the float chamber. The fan will

This article is shown in the accompanying illustration. The motor is a 4-cycle single cylinder engine of the De Dion type with aluminum base and enclosed flywheels. The running gear is of the flexible, reachless style, radius rods run from the rear axle to the angle iron frame, thereby keeping the distance constant from center to center of chain sprocket. The track of the running gear measures 45 inches, wheel base 64 inches, wheels 26 inches; tires are 21-2-inch Dunlop detachable.

Transmission is of very substantial construction throughout, and consists of two individual clutches. It weighs only 25 pounds; the gears run in oil and are in mesh at all times. The two speeds forward are controlled by one lever. A reverse can be added at extra cost.

ELECTRIC HAND LAMP.—A great many accidents have been avoided by using an electric light instead of a match when exploring gasoline tanks. Not only this but the convenience of an electric hand lamp such as that manufactured by Wm. Roche, 42 Vesey Street, New York City, recommends its use. The new Standard flash light manufactured by him will give equal to fifteen hours' service and will give a light whenever required until the battery is exhausted. It is 9 1-2 inches long with a diameter of 1 5-8 inches, and a weight of one pound. Extra batteries and lamps are furnished at small cost.

AUTO WRENCH.—A new wrench intended especially for the service of the automobilist is now manufactured by the Billings & Spencer Co., Hartford, Conn. The bar is drop forged from bar steel and the wrench, finished in two styles, is case hardened. They are made in 10, 14 and 18-inch styles.

AUTOMATIC TIMING DEVICE.—A novel and compact timing device for gas engines has been invented by Charles B. King. This apparatus automatically times the ignition according to the speed of the engine. By its use no attention to a spark shifting lever is required of the operator, and the many bad combinations possible with the hand-controlled lead and throttle, are thus avoided. An engine that has shown apparent lack of power will often prove itself equal to the occasion with one of these timing devices. The device also makes the sparks visible to the operator so that he can see at a glance if each cylinder is working properly. It is ornamental and is arranged to be placed on the dash, but can be connected to any part of



DAYTON DEVICE FOR TIMING IGNITION.

the engine. The case being covered with a glass, it is dust and fool-proof, and requires practically no attention. The complete weight is about four pounds.

This device is manufactured and sold by the Dayton Electrical Mfg. Co., of Dayton, O.

HUNT CONVEYOR.—At the Dusseldorf Exhibition which has just closed, the highest award, the gold medal, was awarded the Hunt conveyor, manufactured by the C. W. Hunt Co., West New Brighton, New York.

STORAGE, REPAIR AND SUPPLY STATIONS SPEED LAWS AND OTHER REGULATIONS

ARIZONA

Brown Bros.

Tucson

Jas. B. Saeger.

CALIFORNIA

SPEED—By local ordinances limited 4 m. to 12 m. Penalties, not exceeding \$500, or imprisonment not exceeding 6 mos. Lamps and Bells—Required by most ordinances. License—In Napa, \$10 a year. San Francisco forbids storage of more than 5 gallons of gasoline within buildings.

San Francisco

Lakin St., 909. Leavitt & Bill.
Tremont St., 97. Manufacturers Co.
White Sewing Mach. Co.

Oakland

Leavitt & Bill.
Mobile Co., of America.

San Jose

Osen & Hunt.
Millard Bros.
Market St., So., 136. Letcher Mfg. Co.

Sacramento

Jim Banta.
Viking Cycle Co.

Los Angeles

Broadway, So., 108. Locomobile Co., of America.
Main St., 439. Crippen & Church.

San Bernardino

Parker Iron Works.
Williams Cyclery.

Riverside

Magnolia Auto. Co.
Stoner Machine Shop.

Redlands

Redlands Iron Works.

Pasadena

Pasadena Machine Shop.
Hodge Bros.

COLORADO

Denver

California St., 1455. Geo. E. Hannan.
Felker Automobile Co.

Colorado Springs

W. O. Anthony.
F. F. Burnstead.

Pueblo

C. W. Fowler.
Pueblo Novelty Works.

CONNECTICUT

SPEED—Outside city limits, 15 m.; inside, 12 m.; reduced at crossings; penalty for violation, not more than \$200. Horns or Gongs—Not required by letter of law. Lamps—Required on all rubber-tired vehicles; must be lighted from 1 hour after sunset to 1 hour before sunrise; penalty, \$5. If lights go out, operator "may proceed at 6 m. and give audible signal as often as 500 ft. are passed over."

Hartford

Aliyn St., 304. S. A. Miner.
Wells St., 43. Hartford Automobile Station.

New Haven

Goffe St., 105. H. C. Holcomb.
State St., 532. Reichert's Auto. Station.

DIST. OF COLUMBIA

Washington

SPEED—Outside city limits, 15 m.; off car-line streets, 12 m.; on intersecting car-line streets, 6 m. License—Required; fee, \$3; penalty, for operating steam vehicles without permit, \$1 to \$40.
Conn. Ave., N. W., 1124. National Capital Auto. Co.

FLORIDA

Jacksonville

F. E. Gilbert.

GEORGIA

Atlanta

Foraythe St., So., 55. C. H. Johnson.

ILLINOIS

Chicago

SPEED—Everywhere in town, 8 m. Bells—Required, to be sounded at street crossings, etc. Whistles and Horns—Prohibited. Lamps—Required; must be lighted between dusk and dawn. License—Operators required to have license; fee, first year, \$3; thereafter, \$1. Fine for driving without license, \$5 to \$25. Numbers or Initials—Not required. Brakes—Two sets required, one independent of driving gear. Special—No machinery may be left running when vehicle is standing in street with no one in charge. In other cities and towns, various local regulations apply.
Calhoun Pl., 4. A. J. Millman.
Cottage Grove Ave., 5311. C. A. Coey & Co.
Plymouth Pl., 12. S. S. Williams.
State St., N., 285. Chicago Auto. Repository Co.
Superior St., E., 385. North Division Auto. Co.
Van Buren and Oakley Blvd. Hagmann & Hammerly.

INDIANA

SPEED—No state law. Various local regulations 8 to 10 m. in city limits. Fine for violation, \$1 to \$50.

Terre Haute

S. Seventh St., 25. A. Chaney & Bro.

IOWA

SPEED—No state law. Davenport City Ordinance limits speed to 8 m. Bell and Lamp—Required.

Cedar Rapids

Cedar Rapids Supply Co. J. C. Pickering.

Des Moines

Eighth and Locust Sts. W. J. Riddell.

LOUISIANA

New Orleans

Baronne St., 400. Automobile Co., Ltd.
Baronne St., 408. Abbott Automobile Co.

MASSACHUSETTS

SPEED—State law provides outside city limits, fire district or thickly settled part of town, 15 m.; inside such limits, 10 m.; approaching horses, reduce speed if animal shows fright and stop on signal of driver; reduce at crossings. Penalty—Fine not exceeding \$200, or imprisonment not exceeding 10 days, or both. Ordinances—Various local regulations in cities and towns.

Boston

SPEED—In city streets, 10 m.; in parks, 8 m.; outside city, 15 m. Lamps—Three required. Parks—Permit required from Park Department. Columbus Ave., 43 and 45. G. T. Gould.
Columbus Ave., 147-153. A. J. Coburn & Co.
Clarendon and Stanhope Sts. Back Bay Hydro-Carbon Repair Co.
Stanhope St., 66-68. Tremont Auto. Headqts.
Tremont and Berkley Sts. Boston Salesrooms.

Cambridge

Mass Ave., 424. Crest Mfg. Co.
Palmer St., 8-10. Harvard Auto. Co.

Salem

Dodge & Lafayette Sts. Zina Goodell Mfg.

Springfield

SPEED—State law applies. Reduce at street intersections. Lamps—Required 1 hour after sunset; not enforced. Alarm—Required to be sounded as necessary. Parks—Permit required for Forest Park; furnished free; rules accompany permit. No registration.

Taunton

Post Office Sq., 4-5. Robertson Auto. Station.

Waltham

Newton St., 136. Waltham Auto. Co.

Worcester

SPEED—10 m. Gong or Horn—Required. State law applies.
Foster St., 43. Worcester Auto. Station, No. 1.
Main St., 671-673. Robinson Auto. Station.

MISSOURI

Kansas City

11th St., E., 320. Day Automobile Co.
Main St., 708. Wittman Co.

St. Louis

Olive St., 3935. Miss. Valley Transportation Co.
Olive St., 4259. Missouri Auto. Co.

NEBRASKA

Omaha

Olds Gas Engine Works.

NEW JERSEY

SPEED—Various city, town and county ordinances, limiting to 6 to 12 m.; penalty, \$5 to \$200. Lamps—Required in some towns, together with alarm signals. Initials—Required by most of the ordinances.

Atlantic City

Atlantic Ave., 1003. J. C. W. Parsons.
Maryland Ave., S., 12. H. W. Cokran.

Newark

Mechanic St., 27. W. B. Dodge.

Paterson

Broadway, 405. F. W. Stockbridge.

NEW YORK

COCKS LAW—Speed—Outside corporate limits, 20 m.; on bridges, 4 m.; inside corporate limits, 8 m., except where higher speed is permitted by local ordinances; penalty, \$50 or imprisonment not exceeding 6 mos., or both. Highway Law (Doughty)—Speed—Outside built-

up parts of towns and villages, 15 m.; in built-up parts, 8 m. Registration—Owner must secure certificate within ten days after getting machine; fee, \$1. Initials—3 in. high, 1/2 in. wide on back of each vehicle. Lamps—2 required, white in front, red in rear; must be lighted 1 hour after sunset, 1 hour before sunrise. Horn or bell required. Brakes—Good and efficient; penalty not exceeding \$25. Local Ordinances—The state law prohibits local town and park boards from excluding automobiles from open highways; from placing lower speed limits than 8 m., and from requiring license or permit except from owners of public vehicles.

New York City

7th Ave., 515. Smith & Mabley.
38th St., 136. Standard Auto. Co.
38th St. W., 138. Oldsmobile Co.
38th St. W., 141. Banker Bros. Co.
43d St. W., 38. A. G. Spalding & Bros.
42d St. W., 50. Banker Bros. Co.
44th St. W., 307. Long Acre Auto. Depot.
44th St. and 5th Ave. Westchester Auto. Co.
50th St. W., 239. Alexander Fisher.
51st St. W., 143. Knickerbocker Auto. Station.
57th St. E., 140. John Wanamaker.
57th St. E., 154. Metropolitan Motor Car Co.
58th St. E., 33-39. Barry & Hayes.
58th St. E., 150-152. Winton Motor Carriage Co.
59th St. W., 306. A. Elliott Ranney.
60th St. W., 10. Webster Auto. Co.
60th St. W., 38. American Storage Co.
66th St. W., 67. St. Nicholas Auto. Depot.
80th St. W., 250. Pa-delford & Bell.
86th St. E., 205. Yorkville Auto. Station.
89th St. W., 202. West End Storage Co.
98th St. and 5th Ave. E. R. Fisher.
100th St., cor. Broadway. Homan & Schulz.
120th St. E., 175. Chas. Strathman.
127th St. W., 152. West End Auto. Exchange.
127th St. W., 153. Harlem Auto. Co.
Broadway, 1684. Central Auto Co.
Jerome Ave., 1915. Hoffman & Setzer.

Brooklyn

Bedford Ave., 712. Lincoln C. Cocheu.
Bedford Ave., 752. J. W. Mears.
Bedford Ave., 1149. Arthur R. Townsend.
Clinton St., 10. Maltby Mfg. Co.
Flatbush Ave., 342-44, near Eighth. A. G. Southworth.
Flatbush Ave., 473. Alex. Schwalbach.
Fulton St., 1239. Brooklyn Auto. Co.
Fulton St., 1241. Chas. W. Spurr, Jr.
Schermerhorn St., 58. Patterson & Shaw.

Albany

Central Ave., 97. Auto. Storage & Trading Co.
Pearl St., N., 167. Albany Auto. Works.
Sherman St., 255. C. F. Weeber Mfg. Wks..

Amsterdam

Division St., 8. Gode & Brown.

Buffalo

SPEED—8 m. on built-up streets, 15 m. outside; rounding corners, 5 m. Lamps—All hours after sunset. State law applies in other regulations.
Broadway, 58-60. D. C. McCann.
Main St., 873-875. W. C. Jaynes Auto. Co.

VOLTMETER.—The Eldredge Electric Mfg. Co., of Springfield, Mass., has placed on the market a voltmeter to meet the needs of drivers of electric vehicles. It is enclosed in a case, somewhat resembling a watch, of simple design, but of metal able to withstand the stress of vibration and accident. The connecting posts have been arranged with nuts that cannot be removed, so that the driver is relieved of one serious danger of irritation.

INJECTORS AND EJECTORS.—Metropolitan Injectors, H. D. ejectors and other jet apparatus for stationary plants, marine and other portable boilers are illustrated and described in a cata-

Rochester

Exchange St., 74. C. J. Connolly.
South Ave., 150. Rochester Auto. Co.

Syracuse

SPEED, ETC.—See state law. No local legislation.
Onondaga St. W., 110. Hoffman & Weaver.
Warren St., So., 346. Syracuse Auto. Co.

Troy

Fulton St., 259. James Lucey.

Utica

Onelda Square. Miller-Mundy Motor Carriage Co.

OHIO

SPEED—Various ordinances in cities, towns and villages, 5 m. to 15 m.; penalty, \$1 to \$100. Lamps and Bells—Required by most ordinances. Registration—No state law.

Cleveland

SPEED—Within 1/4-mile from east and west ends of Superior Street viaduct, 7 m.; outside such radius, 15 m. Must stop upon signal from horse driver. License—Required; fee, \$1. Numbers—Registered numbers must be attached at rear and kept clean. Lamps—One on each side must be kept lighted during darkness. Bell or Horn—Required, and must be sounded when there is danger of accident. Penalty—For violation of any section, fine not exceeding \$50.
Prospect St., 146. The Cleveland Automobile & Supply Co.

Columbus

SPEED—Off of business streets, 14 m.; on business streets, 8 m. Penalty—Fine from \$5 to \$50 or 30 days' imprisonment. Bells or Horns—One or other required to be sounded when necessary. Lamps—Required after dark. Penalty—Fine not exceeding \$50.

Toledo

SPEED—Inside city limits, 10 m.
Jefferson St., 903. Lichtle Automobile Co.

Cincinnati

SPEED—In streets and parks, 8 m. Horns or Gongs—Must be sounded 100 ft. before street crossings. Lamps—Must be lighted between sunset and sunrise. Brakes—Efficient brakes required. License—None required. Initials—None required. Tolls—Bridge toll, 10 cents. Special—Two vehicles must not travel abreast.
Main St., 640. Special Motor Vehicle Co.
Race St., 807-809. Cincinnati Auto. Co.

PENNSYLVANIA

SPEED—Various ordinances limit it 6 m. to 10 m. Penalty—\$10 to \$100. Lamps and Bells—Required by a few ordinances.

Philadelphia

Broad St., N., 138. Quaker City Auto. Co.
Broad St., N., 246. Winton Motor Carriage Co.
Broad St., N., 250. Pennsylvania Elec. Vehicle Co.
Broad St., N., 304. Broad St. Auto. Station.
23d and Walnut Sts. John Wanamaker.

logue recently issued by the manufacturers, the Hayden & Derby Mfg. Co., 85-89 Liberty Street, New York. The catalogue, in addition, embodies a great deal of useful information relating to injectors and ejectors, showing the results that can be obtained under varying conditions found in practice.

TRANSMISSION GEAR.—A power transmission and speed-changing gear mechanism for automobiles which renders the use of a differential gear superfluous is offered by the Marble-Swift Automobile Company, 1464 Monadnock Block, Chicago. The company's description of the device conveys the impression that the mechanism is operated by friction and permits

Lancaster

Queen St., N. 219. E. G. Roth.

Pittsburg

SPEED—6 m. to 10 m. Penalty—\$25 to \$100. Tax—Single-seated vehicle, \$6; others, \$10. Center Ave., 5909. Pittsburg Automobile Co.

York

SPEED—In city limits, 8 m. Lamps—Must display one or more lights.
George St., N., 14. J. P. Oden.
Market and Beaver Sts. J. H. Snyder.

RHODE ISLAND

SPEED—Law provides that any person driving faster than a common traveling pace in any of the streets of Newport or Providence, or in the compact part of any town or village, or in any road leading from Pawtucket to compact part of Providence be fined from \$5 to \$30, or imprisoned for 10 days. For racing on roads, or streets, \$10 or imprisonment for 10 days. Bells and Horns—One or other required, but must not be used excessively. Muffler—Required at all times on public highways. Initials—In black letters 2 in. high.

Providence

Opposite Union Station. H. G. Martin & Co.

TEXAS

Houston

Main St., 1015. Houston Automobile Co.
Texas Ave., 903. Clark & Hawkins.

El Paso

P. L. Abel Cycle Co.
El Paso Cycle Co.

Dallas

D. W. McElroy.
Texas I. & M. Co.

Galveston

Market St., 2129. E. H. Labadie.
Tremont St., 712. J. Christensen & Co.

San Antonio

Commerce St., W., 218. Roach & Barnes Co.
Navarro St., 809. Chas. J. Chabot.

UTAH

Salt Lake City

Main St., So., 33. O. R. Meridith.
2d So. St., W., 62. Wilkes Cycle Co.

WISCONSIN

SPEED—Limited by various ordinances 4 m. to 10 m.; penalties, \$1 to \$50.

Milwaukee

Broadway, 501. Bates-Odenbrett Auto. Co.

of infinite variation of gear speed, including reverse, by the manipulation of one lever.

WALTHAM ADDITION.—Waltham Mfg. Co., Waltham, Mass., has the foundation laid for a three-story, 110 by 45-foot addition to its present factory. The company will manufacture Orient bicycles, motor cycles and light gasoline cars for 1903.

SPARK PLUG WRENCH.—A very handy spark plug wrench is being supplied free by A. L. Dyke, of St. Louis, Mo., with all orders for a dozen spark plugs. This wrench will fit all standard sized plugs and is a most convenient tool.

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Special Notices

Advertisements of second hand vehicles or parts for sale, or for Positions Wanted, inserted under this heading at 10c per line of about six words. Remittance must accompany copy.

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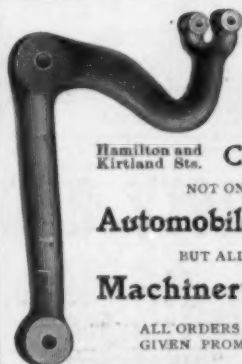
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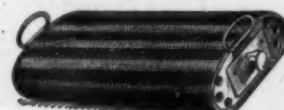
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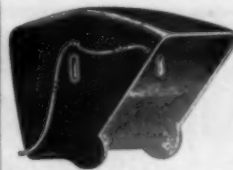
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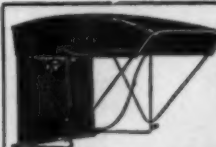
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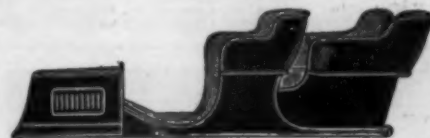
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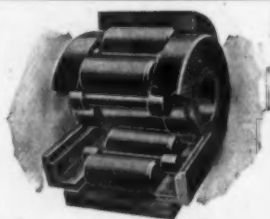
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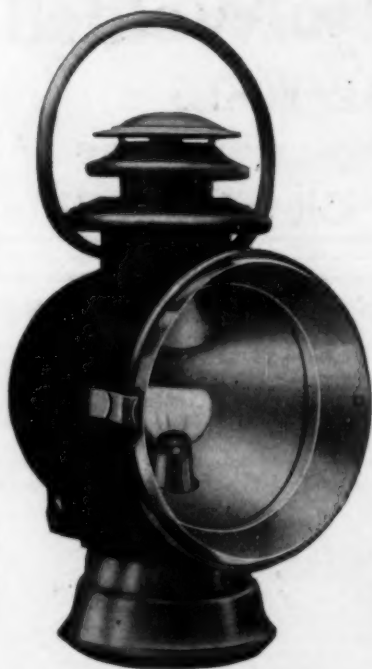
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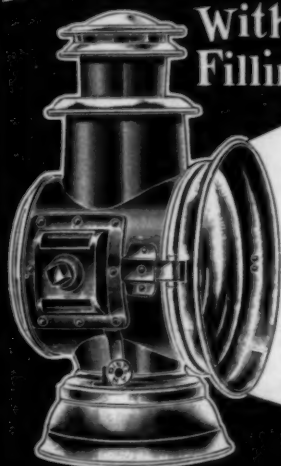


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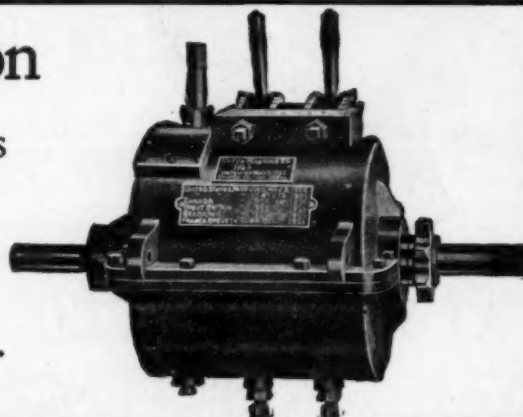
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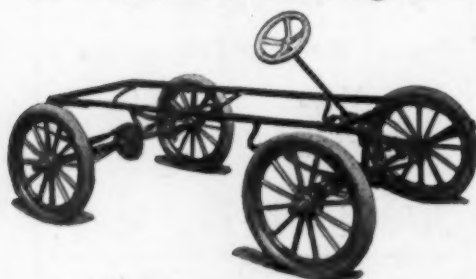
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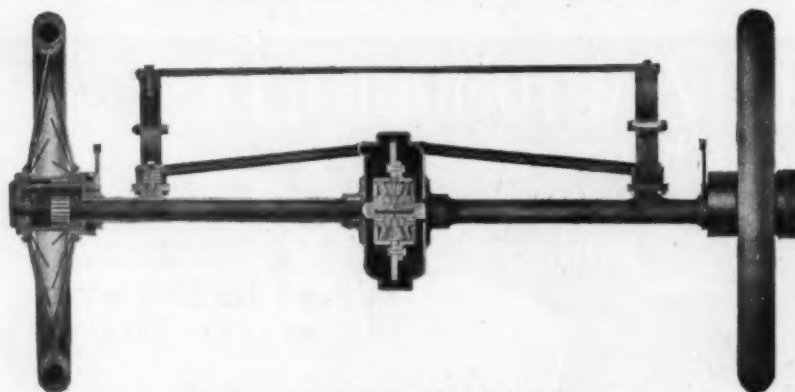
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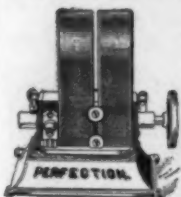
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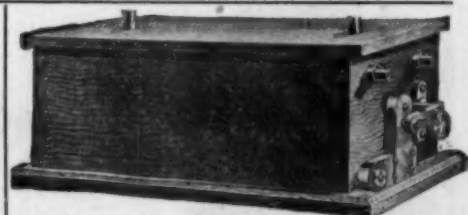


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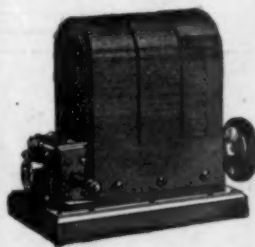
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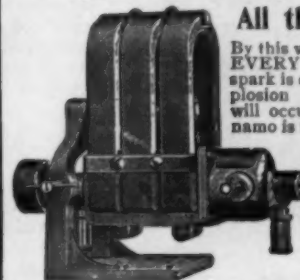
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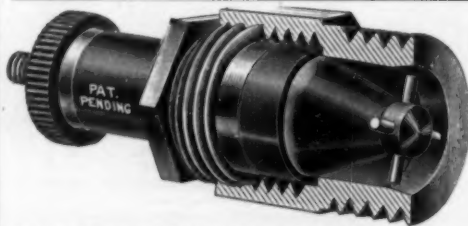
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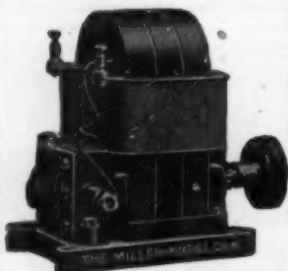
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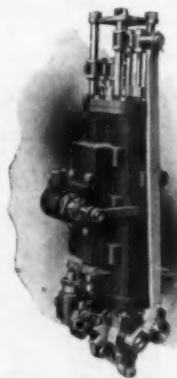


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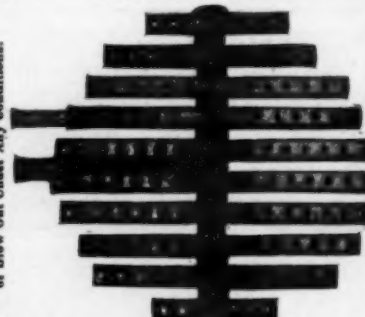
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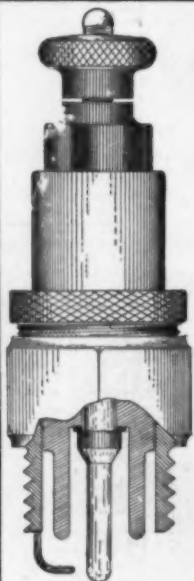
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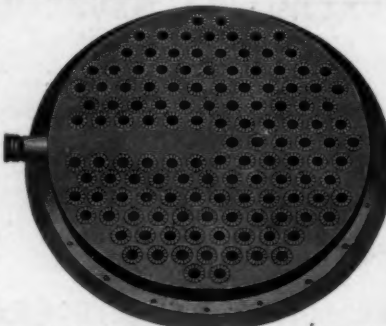
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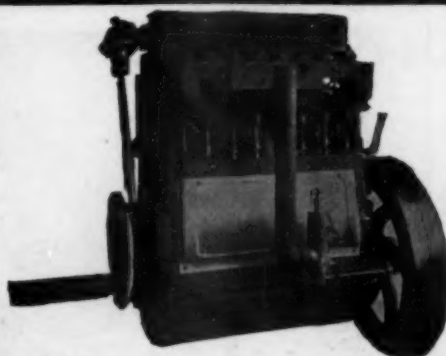
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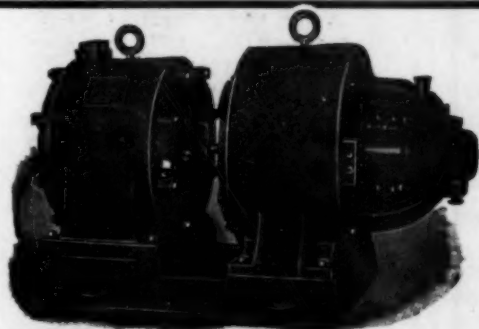
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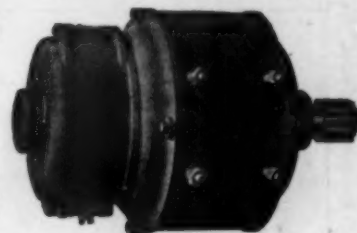
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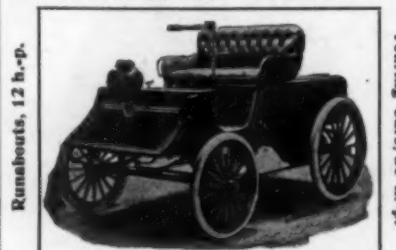
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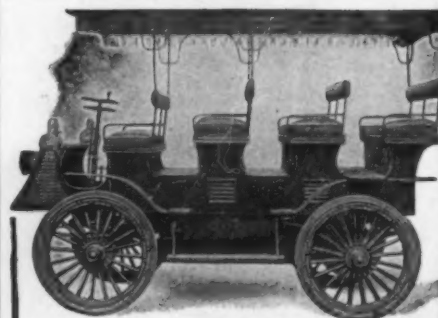
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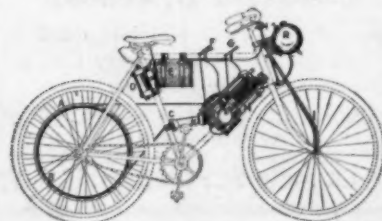
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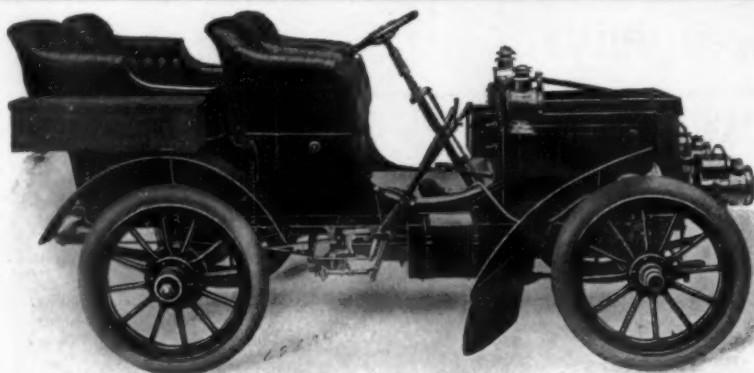
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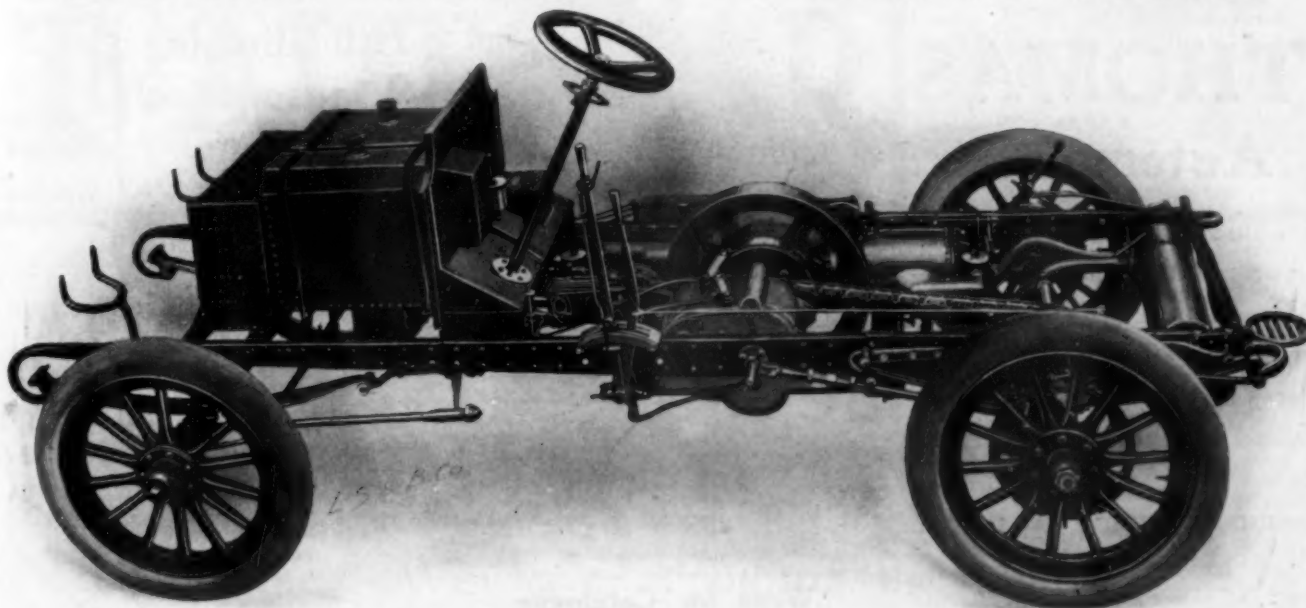
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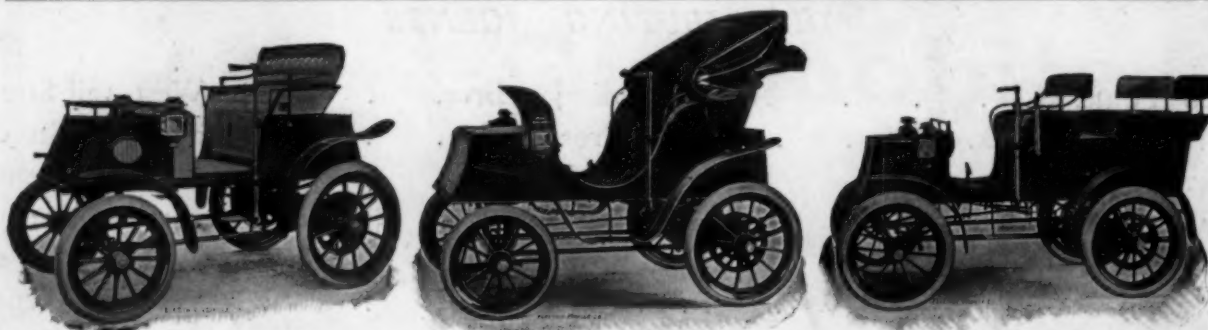
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